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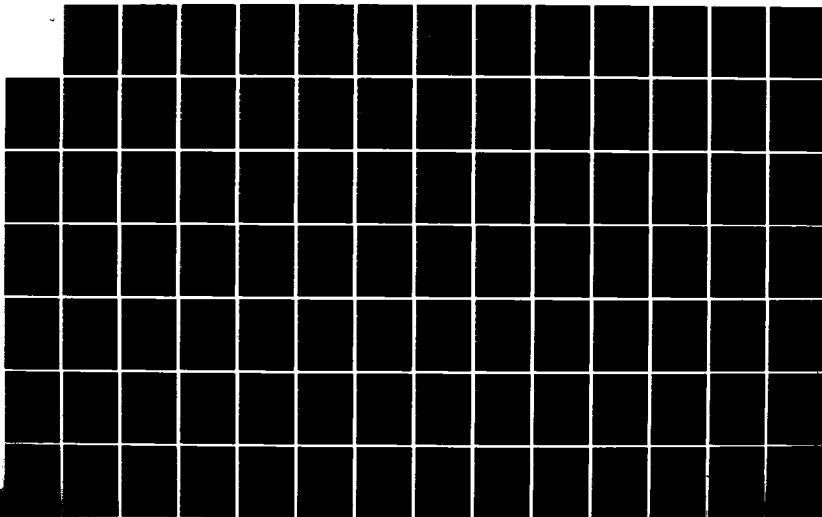
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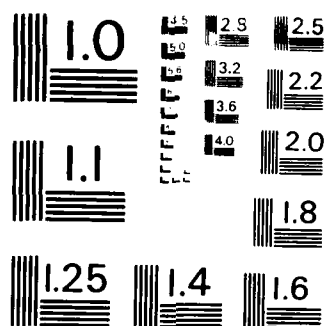
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THE 100-YEAR BASE FLOOD STANDARD AND THE FLOODPLAIN MANAGEMENT

EXECUTIVE ORDER: A REVIEW PREPARED FOR THE OFFICE OF
MANAGEMENT AND BUDGET BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY

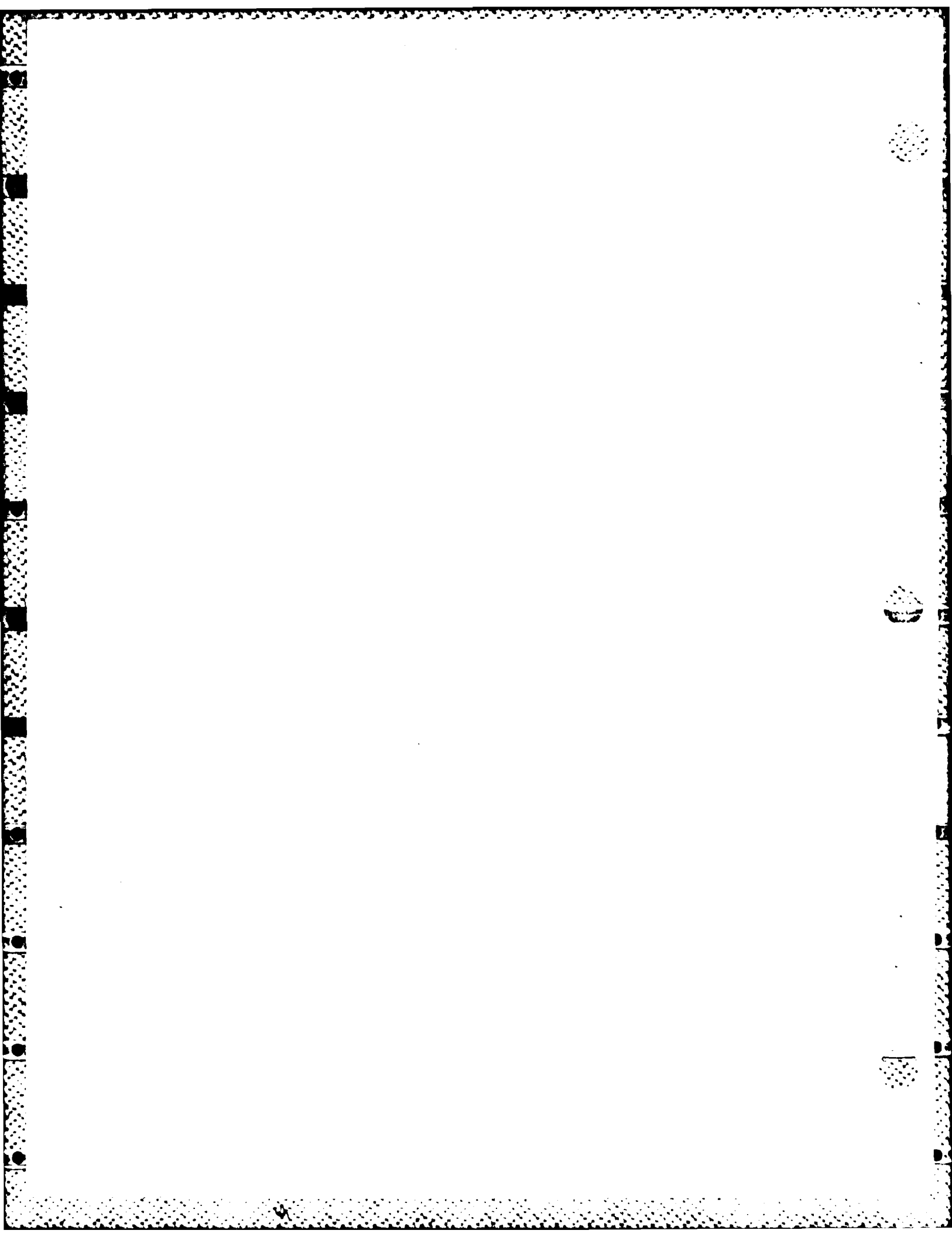
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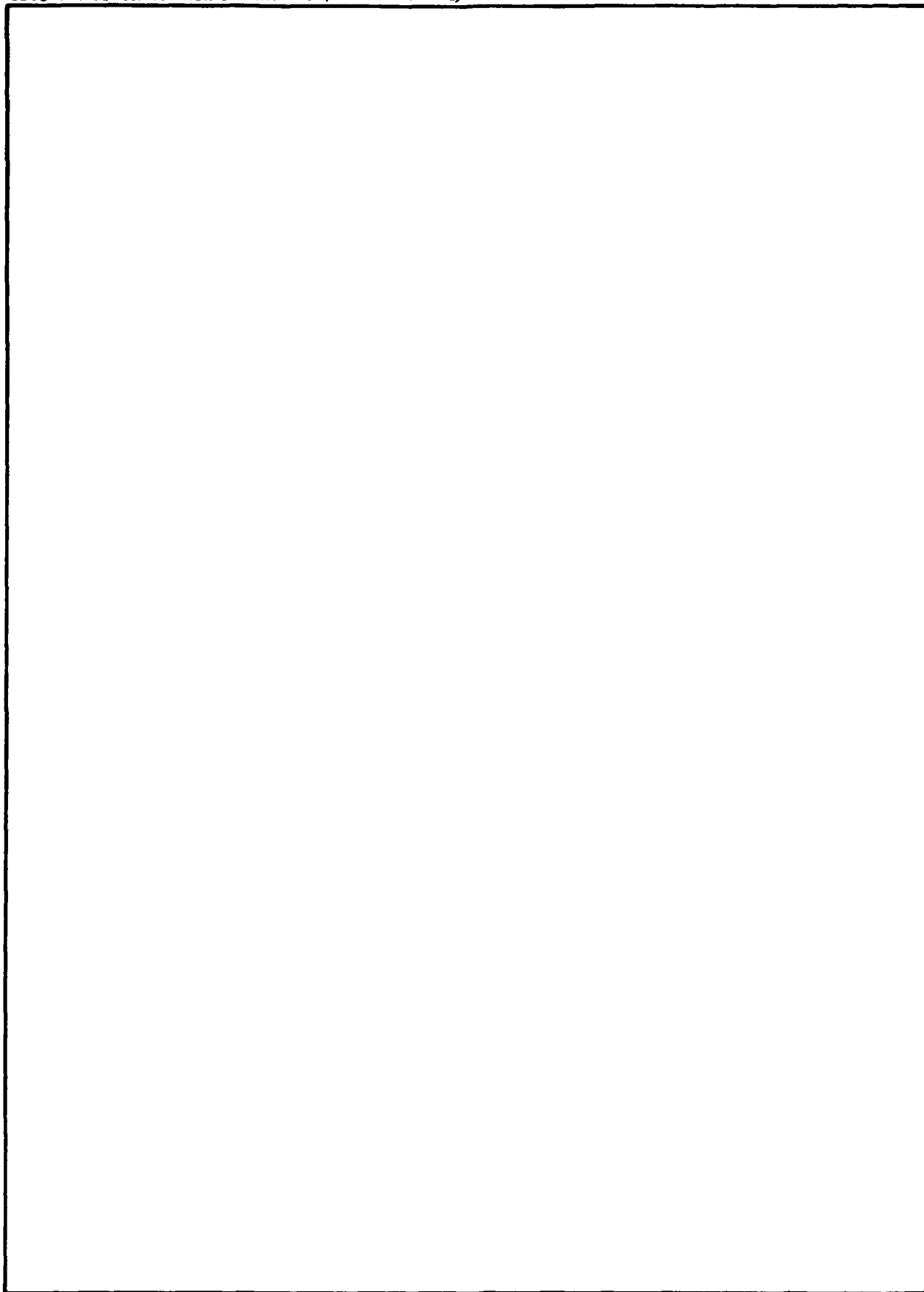
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PREFACE

In January 1981, President Reagan appointed a Task Force on Regulatory Relief, directing it to investigate Federal regulations and policies that might impose a severe hardship on States, local entities, and citizens. Because of the impact of Federal floodplain management policies on future development in floodplain areas and on the State and local governments, which control land use and development, Executive Order (E.O.) 11988 on Floodplain Management and the "100-year-flood" standard upon which it is based were selected for review by the Task Force. In a letter dated August 26, 1982, the Office of Management and Budget (OMB) directed the Federal Emergency Management Agency (FEMA), as the administrator of the National Flood Insurance Program (NFIP) and the Federal agency having lead responsibility for flood hazard assessment and mitigation, to (1) investigate whether Federal agencies are complying with the requirements of the Order and determine what impact, if any, the Order is having on the level of Federal support in designated flood hazard areas, and (2) review the use of the base, or "100-year," flood standard used in implementing the Order and other Federal flood hazard reduction programs.

In carrying out its review task, FEMA assigned a team of staff members to review the history and current usage and application of both E.O. 11988 and the 100-year base flood standard. Information on the intent of the review of these policies was published in the Federal Register, and letters were sent to the heads of all Federal agencies affected by the floodplain management directive and base flood standard and to all State Governors. Through these means, comments on the standard and the Federal policy and procedure reflected in the Executive Order were sought from Federal agencies, the States, local entities, and the private sector.

A total of 171 comments were received from Federal agencies, the States (both Governors and agencies), local entities, and the private sector. The breakdown of responses was as follows:

<u>Group</u>	<u>Executive Order</u>	<u>100-Year Base Flood Standard</u>
Federal agencies	21	14
States	56	40
(Governors)	(19)	(10)
(Agencies)	(37)	(30)
Local entities	25	21
Private sector	22	30
Total	124	105

As indicated in the table, some responses addressed both subjects, while others addressed one issue or the other. Also, more comments were received from those who would be feeling the impacts of the Order and standard than from those who would be implementing them. The States, which have the primary responsibility for both land use and public safety and welfare, and therefore, the greatest concern regarding floodplain management and Federal programs, offered the most comments and suggestions.

In addition to the comments sought from Federal, State, and local governments and the private sector regarding the effectiveness and impacts of

these Federal standards and policies, FEMA reviewed reports to Congress, feasibility studies, Congressional hearing material, reports by experts, and background files. These documents provided insight and explanation as to the development of a common base flood standard, the selection of the 100-year flood as that standard, and the policies and programs of the Federal Government to reduce the escalating costs associated with flooding.

This report presents a historical overview of the need for and development of a national flood hazard reduction program and a standard for implementing that program (Section I), the findings of the review of the 100-year base flood standard and E.O. 11988 (Sections II and III, respectively), and FEMA's conclusions and recommendations based upon that review (Section IV). Because the 100-year base flood standard predates E.O. 11988, is more fundamental, and has broader implications and impacts, it is discussed first. Background documentation (tasking memoranda, comments, and document sources) are contained in the appendices.

It should be stressed that no attempt has been made to analyze the 100-year base flood standard or any alternative standard or E.O. 11988 in terms of economic costs and benefits. Such an economic analysis is beyond the scope of this preliminary, fact-finding review, which is intended to determine whether the 100-year flood is a reasonable standard and whether that standard or the Federal policy regarding floodplain management by Federal agencies are placing a severe hardship on the nation. The responses obtained from Federal agencies, which must implement them, and State and local governments and the private sector, which are affected by them, serve as an indication of whether and to what degree adversity may exist.

I. INTRODUCTION AND BACKGROUND

In order to review a standard or administrative policy, it is essential to first review the historical background on the need for and development of a standard or policy before examining the current situation and the implications and impacts of those policies. This section, therefore, presents background information on the historical need for and development of a base flood standard (BFS), specifically the 100-year base flood standard, and of Executive Order (E.O) 11988 on Floodplain Management in order to clearly understand the objectives of their implementation and whether they are adequately achieving the goals, whether the costs and benefits are being retained in the correct relationship and ratio, and whether options proposed have been considered or tried previously and with what results.

INITIAL FLOOD HAZARD REDUCTION EFFORTS

Historically, people have been attracted to floodplains as a place to live, partly because of the practical necessity of being near water and waterways and partly because of the natural beauty of the floodplains and coasts. Commercial activities dependent on the floodplains have benefited the nation as well as the local communities. However, development of these natural flood reservoir areas also has resulted in economic, and at times human, losses. Like the benefits, these losses are transferred to the nation as a whole, with the general taxpayers primarily bearing the costs of careless development and losses.

As the economic burdens began to outweigh the benefits nationwide, the Federal Government undertook a series of actions designed to reduce flood losses through wise use of flood hazard areas. These efforts began in the early 1900s with authorization by Congress of several specific flood control projects to be carried out by the U.S. Army Corps of Engineers and with the creation of the Tennessee Valley Authority (TVA) in 1933. With the passage of the first Flood Control Act in 1936, the Federal Government embarked upon a national program to utilize flood control structures. In the early 1950s, as it became clear that structural works alone were not sufficient to reduce the increasing losses and costs, the Federal Government began to establish nonstructural flood loss mitigation programs.

In carrying out these various flood hazard reduction programs, both structural and nonstructural, the Federal agencies involved each adopted a method of analyzing the flood problem and selected a base magnitude/frequency flood for use as a base flood standard. Because potential flood levels can be calculated by a number of methods and because structural works (e.g., dams and levees) require a more stringent standard than nonstructural measures, both the method of calculating potential flooding and the standard chosen differed among agencies and programs.

In designing and constructing engineering structural works such as dams and levees to control flooding, TVA adopted a design standard using the "maximum probable flood" as a reference, whereas the Corps of Engineers used the "standard project flood" as its design standard. When TVA began its nonstructural community flood damage prevention program in 1953, it adopted a "regional flood" (estimated as a 50-year, or more, magnitude/frequency level) as its reference. Under the Flood Control Act of 1960, the Corps began its nonstructural flood hazard mitigation assistance to State and local entities

using an "Intermediate" (approximately 100-year-flood magnitude/frequency) base flood level as its nonstructural standard.

In the 1950s, the Soil Conservation Service (SCS) of the Department of Agriculture initiated a watershed protection program using a 25-year-flood magnitude/frequency level as a standard in agricultural flood hazard areas and a 100-year-flood standard in urbanized areas.

MOVE TOWARD A COMMON STANDARD

It gradually became clear that a common standard was needed and steps were taken toward standardizing procedures for assessing flood risks between 1955 and 1970. The effort was triggered in 1955, when Hurricane Diane dumped 10-15 inches of rain in a 30-hour period over much of the northeastern United States, from Pennsylvania to Maine, and left in its wake millions of dollars of property damage plus the tragic loss of over 100 lives. Connecticut, hard hit by the 1955 storm, acted quickly to revitalize its program to restrict channel encroachment. The Connecticut Resources Commission was faced with the selection of an equitable floodplain management standard for establishing encroachment lines. Its study to select a standard considered the 100-year flood; however, this standard was rejected, mainly because agreement could not be reached on a uniform method of computing the flood flows-frequency values. Instead, a standard representing a factor of 5-7 times the mean annual flood, or a 35- to 150-year flood level, was adopted. By 1958, at least six other States had enacted floodplain encroachment laws. Most had enacted their laws following a major flood.

By the early 1960s, the TVA and the Corps were involved heavily in nonstructural, floodplain management studies. Recognizing the need for standardization among Federal as well as Federal/State and local efforts, they agreed on a standard that would identify a major flood without being unduly severe--a flood level representing an intermediate magnitude/frequency that would be derived on a regional basis. The 100-year flood level was selected because a flood of this magnitude and frequency represented a reasonable probability of occurrence and loss worth protecting against and an immediate level that would alert planners and property owners to the effects of even greater flood levels.

In the aftermath of Hurricane Betsy, which struck the southeast Gulf Coast in the mid-1960s, new concern developed over the need for a coordinated national effort to deal with the escalating costs associated with flood losses. During this period a number of studies (Federal and private) were conducted to determine how to handle the situation, both in terms of programs and standards. In 1966, the President submitted to Congress the findings of two major studies: "A National Program for Managing Flood Losses" and "Insurance and Other Programs for Financial Assistance to Flood Victims." Both studies stressed the need for a unified approach and supported the concept of a Federal flood insurance program.

The study of insurance, conducted by the Department of Housing and Urban Development (HUD), concluded that a national flood insurance program was feasible if risk management and flood hazard reduction (floodplain management) accompanied the insurance availability offered and that neither of these aspects would work if there were not an accurate assessment of the risk of

loss and a reasonable standard on which to base the floodplain management and risk-rating mechanisms.

The study examined two proposed methods of measuring risks: (1) use of annual flood damages either in total or by regions of the United States, and (2) use of hydrologic data to evaluate the average annual damages to be expected in each flood-prone area. The first method had been appraised on numerous occasions in the years preceding this study and was rejected by the study group as being infeasible for use in actuarial risk-rating since no completely satisfactory source of national flood damage data existed and because of a lack of uniformity in appraising and defining direct and indirect losses. The alternate approach, the use of hydrologic data, was selected because it is subject to rigorous analysis. As stated in the feasibility report, "The hydrologic method uses the techniques of analysis developed and widely used by hydrologists and hydraulic engineers for many years to determine the economic feasibility of flood protection and flood-abatement projects.... Out of this widespread use of the benefit-cost approach have come standard techniques for integrating flood frequencies with damages to properties from flooding."

The study "A Unified National Program for Managing Flood Losses," conducted by the Bureau of Budget, emphasized the need for a unified approach nonstructural as well as structural approaches to flood loss reduction, establishment of a Federal flood insurance program, and evaluations by Federal agencies before building, financing, or developing programs in floodplain areas. In short, it recommended that the Federal Government take the initiative in developing a comprehensive floodplain management program.

EXECUTIVE ORDER 11296

Based on the findings of this study, submitted to Congress in 1966, the President issued Executive Order 11296, "Evaluation of Flood Hazard in Locating Federally Owned or Financed Buildings, Roads, and Other Facilities, and in Disposing of Federal Lands and Properties," the same year. E.O. 11296

- o directed heads of Federal agencies to provide leadership in encouraging a unified effort to prevent unnecessary use of the Nation's floodplains and to lessen the risk of flood losses;
- o directed heads of Federal agencies to evaluate flood hazards
 - when planning the location and construction of new Federal buildings, structures, roads or other facilities;
 - when administering Federal grant, loan, or mortgage insurance programs; and
 - when disposing of Federal lands or properties; and
- o directed heads of agencies to develop implementing procedures and to certify to the Bureau of Budget that flood hazard evaluations had been carried out for any appropriations requested for Federal construction of buildings, structures, roads or other facilities.

This Executive order set a policy for Federal responsibility and leadership in reducing economic losses caused by flooding. However, this Order did not prescribe a common base flood standard against which to measure proposed actions.

FLOOD INSURANCE: SOURCE OF THE BASE FLOOD STANDARD

With the study on the feasibility of a Federal flood insurance program as a basis, Congress created the National Flood Insurance Program (NFIP) in 1968 with passage of the National Flood Insurance Act. The NFIP is designed to shift the burden of flood protection from the general taxpayers back to those choosing to occupy flood-prone areas. As recommended by the feasibility study, the NFIP makes flood insurance available only in communities agreeing to take at least minimum measures to reduce future flood losses. The emphasis is on nonstructural flood loss reduction measures which are available to all property owners at reasonable costs.

Since insurance can be offered at reasonable rates only with risk management, in this case floodplain management, a set of national standards for use in assessing and managing the risk of loss is of primary concern in implementing the NFIP. Therefore, HUD began its administration of the NFIP by calling a group of experts together to advise the agency as to the best standard to be used as the basis for risk assessment and management purposes for this program. This group recommended the 100-year base flood standard that was adopted by the NFIP in its regulations. The 100-year flood event represents a magnitude/frequency that has a statistical probability of being equalled or exceeded annually, or in property terms a one in four (25 percent) chance of occurring during the life of a 30-year mortgage. Thus, the 100-year event represents a degree of risk and damage worth protecting against. On the other hand, it is a level of protection that does not impose stringent requirements or the burden of excessive costs on property owners. As an intermediate-level of risk and potential loss, it also is sufficient to make people aware of the greater magnitudes and frequencies of flooding that could occur.

The 100-year base flood is the standard in an engineering study used by the NFIP to prepare maps depicting the flood hazard within a community. These maps are used by city officials and developers when making decisions about the location and degree of flood protection required for structures and by the Federal Insurance Administration for insurance rating. The maps also are used by lenders to determine flood insurance requirements and by insurance agents to determine insurance premium rates for specific properties.

To allow for the possibility that floodplain conditions depicted on these maps may change and for possible corrections or refinements, several appeal mechanisms exist. An appeal period is provided prior to the effective date of the map. Once in effect, individuals may submit scientific, technical and legal documentation to demonstrate that the elevation of a structure warrants exclusion from the special flood hazard area designation and receive a letter of map amendment (LOMA). Communities may rule that a structure warrants granting of a variance to zoning ordinances governing the use of land in special flood hazard areas. Through these mechanisms protection is provided against undue hardships and inequities imposed by use of the base flood standard.

It should be noted that based on loss experience, FEMA has determined that a much larger incidence of flood damage exists in areas with "moderate"

(between the 100-year and 500-year boundaries) and "minimal" (above the 500-year flood boundary) flood risks than those terms imply. The minimum floodplain management requirements under the NFIP participation regulations only apply to the 100-year flood areas (A Zones) and the coastal high-hazard areas (V Zones). Encroachments upon the floodway adopted and regulated by the community are prohibited because of the need to pass flood waters through the main channel and limit the flood exposure to additional areas that would not otherwise be flooded. In areas of "moderate" and "minimal" flooding, where losses do occur, communities are strongly encouraged to take protective measures against low-level flooding.

CONGRESSIONAL CONCURRENCE ON STANDARD SELECTION

During Congressional hearings prior to passage of the Flood Disaster Protection Act of 1973, the Senate Committee on Banking, Housing and Urban Affairs, which has oversight responsibility for the NFIP, heard arguments on both sides of the controversy regarding the appropriateness of the 100-year base flood standard. Several witnesses advocated a proposal to apply a lesser standard and some recommended the use of the greatest flood of record as a floodplain management standard for each given area rather than an established base flood standard to be applied nationwide. As administrator of the NFIP at that time and thus an agency concerned with the insurance risk-rating aspects and actuarial soundness of an insurance program as well as floodplain management considerations, HUD pointed out that the 100-year flood represents a compromise between minor floods and the greatest flood likely to occur in a given area, that the highest recorded flood level in a given area is almost entirely the result of chance and reflects what has happened rather than what could happen, and that in many cases the 100-year flood level is less than the flood of record.

After considering the statements of all interested parties, the Committee concluded that the 100-year standard was reasonable and consistent with national objectives in reducing flood losses.

EXECUTIVE ORDER 11988

In 1975, the Comptroller General's report "National Attempts to Reduce Losses from Floods by Planning for and Controlling Uses of Flood-Prone Lands" found that Federal Agencies did not adequately evaluate flood hazards in their programs. Specific agencies cited for failure to carry out the flood hazard evaluation directives for Executive Order 11296 included the Department of Housing and Urban Development, Veterans Administration, Farmers Home Administration, and General Services Administration.

The report also cited the need for placing greater emphasis on providing flood hazard technical assistance through the Corps of Engineers, Soil Conservation Service and Tennessee Valley Authority and monitoring of Executive Order 11296 by the Office of Management and Budget. It also called for a more effective effort by the Water Resources Council (WRC) to implement the National Program for Floodplain Management as assigned earlier by the Bureau of Budget in response to Congressional direction contained in the National Flood Insurance Act of 1968. In 1976, partly in response to the Comptroller General's findings, the WRC recommended that the President implement a Unified National Program for Floodplain Management and revise Executive Order 11296 to, among other things, formalize the relationship of

the Order to the 100-year base flood standard to be consistent with the standard utilized by the National Flood Insurance Program and communities across the Nation.

In 1977, the President issued E.O. 11988, which superseded E.O. 11296. The new Executive Order developed out of the earlier order, adding monitoring and enforcement mechanisms and establishing a standard, the 100-year base flood standard. In 1978, WRC adopted Floodplain Management Guidelines, which gave the Federal agencies a process for analyzing and assessing the impacts of activities in the floodplains.

As this brief history suggests, the Executive Order and the 100-year base flood standard have evolved together over a 15-year period. The current review of the implementation of the Order and the appropriateness of the 100-year base flood standard is timely and is providing the periodic evaluation called for by E.O. 11988.

II. REVIEW OF THE 100-YEAR BASE FLOOD STANDARD

THE 100-YEAR BASE FLOOD STANDARD

The 100-year flood level represents a magnitude that has a 1 percent chance probability of being equalled or exceeded annually, thus the name 100-year flood. However, this frequency calculation is a statistical probability, and levels of this magnitude have been known to occur with greater or lesser frequency and even to occur in successive years. In terms of property investments and risk, there is a one in four (25 percent) chance of an event of this magnitude occurring during the life of a 30-year mortgage.

The 100-year base flood level is determined from an analysis of hydrologic data (indicating the occurrence, circulation, distribution, and properties of water) and hydraulic data (indicating water motion). The analysis, therefore, considers water velocity, depth, and turbulence as well as the local topography, land cover, and flow-resisting obstructions. The analysis also takes into consideration historical data on frequency, depth, damage, and extent. This hydrologic and hydraulic analysis is site-specific for each study area.

CURRENT APPLICATION

Federal

Under Executive Order 11988, all Federal agencies are required to utilize the 100-year base flood standard in actions relating to floodplains and floodplain management. As pointed out in Section I, historically those Federal agencies involved in floodplain management activities were utilizing the 100-year flood or its equivalent as a base flood standard for nonstructural programs prior to this Executive action.

States

Since the establishment of the National Flood Insurance Program in 1968, 42 States plus the Commonwealth of Puerto Rico have adopted the 100-year flood as a base flood standard for floodplain management purposes, either by State law, regulations, administrative procedures, or executive order. The District of Columbia, Guam, and the Virgin Islands have proposed legislation pending. The State of Wyoming plans to enact legislation adopting the 100-year base flood standard in 1983. The status of the 7 remaining states is as follows:

- o Delaware has not enacted a Statewide floodplain management law; flood hazard reduction is on a community-by-community basis under the NFIP participation.
- o Georgia has not enacted a law specifically aimed at the 100-year standard on a Statewide basis. They have a State law adopting a standard for the Chatahoochee River in the vicinity of Columbus. The State actively supports the 100-year base flood standard and the NFIP.
- o Idaho does not have a State floodplain management law, adoption of the 100-year standard and flood hazard reduction measures is on a community-by-community basis.

- o Louisiana has not enacted a State law that adopts the 100-year base flood standard. The State agency for coordinating floodplain management policies indicates that it supports the 100-year base flood standard as most appropriate. This State was one hard hit by Hurricane Betsy and consequently one of the initial advocates of a program to reduce damages from flooding.
- o Nevada does not have legislation adopting the 100-year base flood standard; however, communities may adopt one on an individual basis. Approximately 85 percent of the land in the State is Federally owned, and therefore, under Federal policies.
- o Utah has no State law on floodplain management; however, adoption of such laws and a base flood standard is on a community-by-community basis. Many Utah communities are participating in the NFIP and have adopted the 100-year base flood standard.
- o West Virginia has not enacted a State law concerning the standard; each community is free to adopt its own standard and implementation program. Several communities have initiated programs and have adopted the 100-year base flood standard.

Many of the States not only require communities to adhere to the 100-year base flood standard but insist that it be exceeded by a degree of freeboard. These freeboard provisions generally require that the lowest floor of structures be elevated on the order of 1-2 feet above the 100-year base flood elevation.

Communities

Under the NFIP, participating communities are required to adopt and enforce at least minimum floodplain management measures, using the 100-year flood as the base flood standard. As of April 30, 1983, 17,416 communities were participating in the NFIP, with a total of 1,870,273 insurance policies in force at a total value of \$107,298,328,000. In some cases State or local governments impose mandatory or more stringent requirements than those required for voluntary participation in the NFIP. It should be noted as well that NFIP flood insurance policy data indicate that almost half of the actuarially rated structures in the participating communities have been built 2 or more feet above the required 100-year base flood elevation. Moreover, this fact holds true regardless of the structure type, flood zone, flooding type, and State floodplain management activities. Thus, using caution in interpreting these data, it can be assumed that the property owners within the communities do not feel the 100-year flood standard is unreasonable or they would only build to the 100-year base flood elevation.

REVIEW

Overview

In response to the request for comments regarding Federal use of the 100-year flood as the base flood standard for floodplain management purposes, 105 responses were received from Federal agencies, States (Governors and agencies), local entities, and the private sector. All but a few of these comments were supportive of the 100-year base flood standard. However,

approximately 30 responses offered suggestions for refining the methodology used in determining the 100-year flood area or for modifying NFIP floodplain management requirements based on that standard. One response requested a clarification of Executive Order 11988 regarding use of the 100-year base flood standard, and two requested a change in the NFIP requirements regarding elevation to the 100-year base flood level although general support was given to the 100-year base flood standard. Three responses advocated the use of a standard other than the 100-year flood.

Support for the Current Standard

Use of the 100-year base flood standard in the administration of the NFIP has had a major impact on State and local governments and programs and on the private sector. As indicated previously in this report, the standards set by the NFIP have been adopted by all States and over 17,000 local entities. These standards include minimum floodplain management measures based on the 100-year base flood level as well as the use of the 100-year base flood standard itself in determining risk. Therefore, responses from these public and private sectors provide a good indication of whether the 100-year base flood standard is having an adverse impact or is believed to be a burden.

The responses from all sectors indicated a strong support of the current standard, however. Reasons for retaining the standard vary but basically reflect the fact that the communities, States, and private sector as well as the Federal agencies believe it is working, it is not unduly restrictive, the alternatives are not any better, and a change at this point would be disruptive and costly. The following excerpts from the responses are reflective of the comments received. (The codes refer to response categories--Federal, Governors, State agencies, Local entities, and Other--and response number in the catalog of responses.)

- o "The choice of the nationwide 100-year flood-frequency standard may be considered arbitrary, but it has been in use by State and Federal agencies in all parts of the country before its adoption by Congress in the 1974 amendments to the National Flood Insurance Act of 1968. It had been based on the judgment of engineers, hydrologists, and planners, and over a period of nearly four decades has been generally accepted by legislative bodies and the courts. Perhaps its most arbitrary aspect is the setting of a boundary when it must be kept in mind that still larger floods will cross this boundary. Nevertheless, there seems to be general agreement that for regulatory purposes delineation in terms of a boundary is needed. Given this need, the standard is sensitive to local conditions in that probability of inundation can be quantified and equalized across the wide spectrum of variability in drainage basin size, channel morphology, topography, and climate.

"The specific risk factors mentioned in the notice, water height, velocity of flow, frequency of flooding, quality of flood water, historical flood loss experience, socioeconomic costs, and maximum average annual damage, all apply after a development has been flooded. Thus, for a new development, they apply after flooding has exceeded the regulatory boundary. The 100-year standard fully accounts only for frequency of flooding. The

other factors would require additional studies, some of considerable complexity. Of the factors, the last four mentioned above could vary greatly not only on basis of locality but also with time. The development of applicable national standards based on these factors has not been accomplished. However, it is clear that if the remaining risks above the 100-year floodplain are to be considered, local conditions must be taken into account. Although frequency of flooding presumably would be small, a standard higher than the minimum would seem to be appropriate where local conditions could lead to loss of life. Of particular concern would be areas above the 100-year floodplain subject to flash floods, a risk factor not mentioned...." U.S. Department of the Interior (F-25)

- o "The 100-year flood is a reasonable standard which provides for public safety without unduly infringing on individual rights." Michigan (G-10)
- o "The 100-year frequency flood level is a reasonable standard which is widely accepted and scientifically valid. Based on both flooding history and probability, it assesses the most important risk factors of water height/frequency, velocity and historical loss experience. Regulation to a lesser protection frequency would not provide sufficient public protection or approach the problem on a cost-effective basis." Georgia (G-5)
- o "Technically or administratively, any modification of that standard would be unbelievably disruptive to all the efforts that have been made, and are presently underway, relative to floodplain management. ...there is nothing to indicate that any other standard would be any more desirable or beneficial." Pennsylvania (G-21)
- o "...the benefits derived from retaining that flood standard far outweigh possible negative impacts that may be ascribed to economic losses due to denial of development opportunities." Puerto Rico (S-26)
- o "The hundred-year flood (or one percent chance flood) we feel is an excellent compromise between the extremes of the 'Biblical Flood' and the mean annual flood. Most buildings are constructed to have a useful life in the hundred-year range, and even if the mortgage life of a building (about thirty years) is considered, the likelihood of damage from a hundred-year flood is one in four, pretty good odds. We believe that weakening of this standard would have the effect of increasing future flood damages." Missouri (S-17)
- o "Illinois standards are based on quantitative and qualitative historical data and are used to regulate floodway encroachments and construction of damageable structures. Our floodplain regulatory standards significantly exceed those of FEMA since they provide considerably more protection from flood hazards. We do not allow floodway encroachments, either singularly or cumulatively, to significantly increase the 100-year flood

elevation over one foot and that the lowest damageable floor of homes or small businesses be at least one foot higher than the 100-year flood elevation. We feel that the experience gained since adopting our standard confirms that they are appropriate and justified." Illinois (S-7)

- o "...the 100-year flood standard, in conjunction with existing NFIP regulations, appears to be achieving the original intentions of the National Flood Insurance Act of 1968 to reduce future flood losses in the United States. At the same time, this uniform standard has facilitated the timely adoption of floodplain management measures at the local level and the conduct of engineering studies to identify and map flood hazard areas and establish base flood elevations for insurance rating." Florida (S-4)
- o "Our experience has shown that the 100-year standard can account for many risk factors and is, in our opinion, a wholly desirable standard." Riverside County, California (L-11)
- o "If FEMA were to adopt...[a] variable standard, accounting for '...water height, velocity of flow, frequency of flooding, quality of flood water, historical flood loss experience, socioeconomic costs, and maximum average annual damage,' then FEMA would generate a program [NFIP] which, we believe, could never be administered equitably. Furthermore, FEMA acknowledges that the 100-year standard has been adopted by most State agencies prior to Congress officially adopting it in 1974. In addition to causing problems with the NFIP, we believe that the suggested changes would adversely affect many other State and Federal programs." Chicago, Illinois (L-21)
- o "The city of New Orleans supports the 100-year standard in Orleans Parish. The existing 100-year floodplain boundaries and elevation requirements are generally appropriate and take into account a sufficient range of risk factors in this area."

"The increase in construction costs due to these existing requirements are more than compensated by the continuing protection they afford to property owners. However, any more restrictive floodplain elevation requirements in Orleans Parish could prove too burdensome to property owners and are, therefore, not warranted at this time." New Orleans, Louisiana (L-22)
- o "The Urban Drainage and Flood Control District strongly supports the 100-year flood standard as the basis for floodplain management. As you point out in your request for comments, the 100-year flood standard has been extensively used since at least 1968. The Urban Drainage and Flood Control District adopted the 100-year standard in 1970, one year after the District was established, and we have used that standard to this day. In that time we have defined 100-year floodplains along approximately 700 miles of major drainageways at a total cost to Denver local governments of over \$2,700,000. Twenty-nine local governments within the District have adopted floodplain regulations, all of them based on the 100-year flood standard. Untold numbers of

land use decisions have been made on the basis of the 100-year flood standard. A change from the 100-year standard to some other standard would without doubt be very disruptive or totally destroy what we feel is an excellent floodplain management effort in the Denver metropolitan area." Urban Drainage and Flood Control District, Denver, Colorado (1-17)

- o "This association represents the nearly 3000 soil and water conservation districts in the 50 states, Puerto Rico and the Virgin Islands. Conservation districts have been involved in flood control projects and floodplain management programs in many areas of the nation. It is our opinion that the 100-year flood standard for flood protection projects, floodplain management, and flood insurance is an appropriate standard. It is widely accepted and recognized. To change the standard would be unwise." National Association of Conservation Districts (O-23)
- o "The one hundred-year flood standard is a reasonable compromise between the rarer floods of greater magnitude and the more frequent floods of lesser magnitude."

"Missourians have suffered from two hundred-year floods in 1982: In the Greater Kansas City Area in August, and in the Greater St. Louis Area this month [December 1982]. We feel that a lessening of the standard would have the effect of increasing future flood damages." Missouri Association of Soil and Water Conservation Districts (O-19)

- o "A national standard is necessary, and the 100-year standard is reasonable and widely used. All states that have adopted a standard use, use the 100-year standard. About 17,000 communities in the nation use the standard in their local floodplain management regulations. Thousands of miles of floodplains have been mapped and regulated using the standard. To modify that standard would cost taxpayers and developers untold sums of money and time." Association of State Floodplain Managers (O-12)
- o "While we feel that the uniform application of the 100-year flood standard does not always result in uniform protection from flood losses, we feel that this standard is the best available for widespread application." Coastal Properties Institute, Inc., Hilton Head, South Carolina (O-8); New Orleans East, New Orleans, Louisiana (O-25)

Suggested Improvements in Application

Most of the comments regarding improvements in the application of the 100-year base flood standard related to designations of elevations or floodplain management standards of the NFIP, which are based on the 100-year flood standard. Specifically, these comments generally indicate a desire for greater flexibility in the appeal process; greater sensitivity to local conditions; inclusion of factors such as sediment transport; the effects of future development on flood levels; consideration of special risks in areas subject to deep and/or fast-flowing water; greater emphasis on the need for

higher standards in high-risk areas; reevaluations to adjust for experienced flooding; and inclusion of velocity, frequency, and other risk data in the Flood Insurance Study report.

Because these comments relate to the application of the standard in a specific program or in regard to the Executive Order rather than the standard itself, they will not be addressed to any extent in this review, but will be discussed in the review of Executive Order 11988 and also submitted to the NFIP for consideration. However, some discussion of certain comments related to the standard are warranted here.

One such comment dealt with the need for stronger standards in high-risk areas. It should be noted that Federal standards and NFIP participation requirements setting forth floodplain management standards necessary to reduce the insurance risks are base, minimum standards. The primary responsibility for public safety and land use rests with the States and local entities. As the State of Minnesota pointed out in its comments, "The sensitivity to local conditions is not an issue related to the 100-year standard but to the way in which the standard is applied to a given flood prone area. Providing local government with the flexibility to, within reason, dictate or select the floodway for their community, determine the appropriate freeboard to be incorporated, and determine the development uses for the flood fringe are means to currently reflect sensitivity to local conditions." (S-15) The local communities have a responsibility to consider local conditions in their planning for flood-prone areas. They should restrict development in those areas where the product of the velocity and depth exceeds a safe limit.

Another comment indicated a need to include an adjustment for expected probability in computing flood levels to compensate for the lack of adequate stream flow records. In 1978, the NFIP requested the National Academy of Sciences (NAS) to determine whether and, if so, how the concept of expected probability should be applied to provide an estimate of peak flows at probabilities of annual occurrence as part of flood insurance studies for communities in riverine areas. The NFIP recommended that NFIP not use the expected probability adjustment.

Another issue raised in the comments related to the use of a lesser standard in areas protected by levees. The degree of protection needed behind a levee has also been addressed by the NFIP through the National Research Council. The NRC's report, published in 1982, states that "Any levee runs the risk of overtopping and structural failure during floods. Accordingly (based on a reasonable risk before requiring a given activity), a levee may be recognized with respect to none, all, or only selected ones of the above listed measures (provision of flood insurance at actuarial rates; land development and building construction regulation; mandatory purchase of flood insurance in high-risk areas; restriction in the placement of critical planning, including warning and evacuation). The risk of levee failure varies with many characteristics, but the primary variable for purposes of levee recognition must be the flood frequency associated with overtopping."

The Department of Housing and Urban Development (HUD) has continued to request a clarification of whether the agency can "deviate from the 100-year flood level structural requirements imposed by NFIP and WRC (in favor of the 50-year flood level contained in the current Minimum Property Standards)" for residential basements. This issue primarily relates to the review of the

Executive Order and the relationship between HUD, MPS and the National Flood Insurance Program rather than a discussion of the 100-year standard, although it does pertain to application of that standard. The issue is discussed in detail in Section III.

The Louisiana Intercoastal Seaway Association (0-17) also recommends a deviation from the 100-year base flood standard, but also in terms of its application in the NFIP elevation requirements. The primary issues concern the calculation of wave heights by the NFIP and its requirement that all structures in coastal high-hazard areas be elevated--a problem for coastal industries. These issues again pertain to the application of the 100-year base flood standard and are currently being addressed by the NFIP.

Recommended Changes in the Current Standard

75-Year Standard

"As a result of the blizzard of April 6-7, 1982, Scituate [Massachusetts] suffered heavy losses to property along the shoreline. If it has finally been determined that this storm was a 75-year storm, then we feel that the 100-year flood standard should be replaced by the 75-year flood standard." Scituate, Massachusetts (L-25)

In reviewing this recommendation, there appeared to be some confusion. Scituate has suffered severe damage from at least three events in the past decade. In 1972, close to \$2.5 million damage occurred. The largest of the three events, estimated by the U.S. Army Corps of Engineers to be about a 100-year flood, occurred February 6-7, 1978, damaging or destroying 700 beachfront properties and causing between \$16 and \$20 million damage for Scituate alone. Of the 650 flood insurance policies in effect, claims were submitted on 480. The storm in April 1982 (cited above as a 75-year flood event) caused significant damage but nothing approaching the magnitude of damage caused by the other two events. Because of the lesser impact of the storm recommended as a standard and the fact that Scituate has become a leader in using innovative measures to mitigate the flood hazard, this recommendation to use a 1982 flood level, which would be a 75-year standard, seemed unclear.

An inquiry to Scituate clarified the recommendation as being use of the 1978 storm (not the 1982 storm), which was believed to be a 75-year flood event. In fact, it was approximately a 100-year flood. The community indicated that perhaps a stronger standard should be used and advocated incorporation of wave heights and a factor for coastal erosion into the methodology.

Optional Adherence to Standard

The Pacific Legal Foundation (0-28) indicated, based on its belief that the 100-year flood standard as applied is not sufficiently sensitive to local standards, that communities designated as being in a floodplain but having no historical data of a 100-year flood event should have the option of choosing as a base flood level (1) the highest flood of record during the preceding 100 years or (2) if the highest flood level for that period cannot be determined, the highest flood of record for the total period for which data are available.

As a note of caution, while historical data are an important consideration in determining areas subject to inundation, they are only an indication of what has been, not of the true risk of future damage. As testimony before the Senate Committee on Banking and Housing and Urban Affairs in 1973 indicated, it would be impossible to establish flood safety elevations based on historical storms alone.

Therefore, to use history alone would be as unwise as to require designation of the most-recent flood level as the only level to be protected against. The flood record is meaningless except to measure what has happened. For sound floodplain planning (and flood insurance purposes), a prediction of what can happen is essential. To use a historical standard in locales where a severe flood has never occurred would lull residents into a false sense of security, perpetuating the potential for damage to property, and jeopardizing lives. On the other hand, to use a historical standard in places where a very severe storm has occurred could subject both the private sector and the public to a higher standard that would cause undue hardship. Communities must be alerted to what can happen before the flood occurs, and not after it is too late.

In addition, such great variation makes a national standard and a uniform, nationwide basis for program administration and implementation, particularly in conjunction with the NFIP, impossible.

Average Useful Life

Hollywood, Inc., Hollywood, Florida, indicated that a better approach to the 100-year standard would be a standard equivalent to the useful life of the facility being insured. The estimate provided for this area was averaged to 60 years, recognizing that an average useful life would be needed for each area. The response also expressed concern with higher construction costs resulting from the higher level.

FEMA experience shows the useful life concept is not applicable for estimating flood levels for floodplain management. The parameters necessary to estimate the useful life of a facility include several not related to water damage. In 1977, the Federal Insurance Administration (FIA), then under HUD, commissioned a study attempting to establish reliable estimates of the useful life of coastal residential structures. It was intended that these estimates could be used to determine setback lines and insurance rates for coastal erosion hazard areas. The study results indicated that there were no direct quantitative answers readily available.

The expressed view about the useful life concept represents the initial thoughts of many people. These thoughts usually reflect only the cost attributed to the private investments. Flood damages result from both private and public investments. There is a trade-off between short-term benefits that are gained by the private investor and the long-term cost to the general public.

It is the general taxpayers who have invested billions of dollars in flood control measures to protect private property, provided subsidies for flood insurance for existing structures, provided disaster relief, and financed roads, bridges, etc. Both interests must be considered and a proper balance obtained.

Expected Average Annual Damages

Mr. L. Douglas James of Utah State University (O-16) recommended the standard proposed in a paper entitled "Dealing with Variable Flood Hazard." This standard utilizes a concept of regulating floodplain development on the basis of expected average annual damages. This alternative would restrict people from locating anywhere the expected average annual damages would exceed some percentages of the value of their buildings. This concept would result in different types of structures having different elevation requirements.

The annual damage concept is reasonable from a theoretical standpoint as a basis of floodplain risk evaluation. It is an attempt to evaluate the risks of individual structures. The method has disadvantages that in actual practice make it less desirable for risk analysis on a widespread basis. As stated in the paper, "The major disadvantage with the damage method is its greater complexity. More information (for identifying the flood-prone property and estimating damage to it as a function of the full range of influential factors) is required, much of it is harder to obtain, and the results may be harder to explain to administrators and to the public. Enforcement of gradation in legal uses requires more careful field inspection and may lead to court cases over whether a particular use falls in a legal or an illegal classification. Furthermore, an average damage curve is not equitable in its treatment of people who are subject to either substantially more or substantially less damage than the average for their classification. The classification problems would have to be carefully resolved before the method is implemented." In addition to the above-stated disadvantages, the funding that would be required to revise the studies for all floodprone areas using another methodology could approach the \$600 million already expended. Federal expenditures of this magnitude would not justify a change to another standard that is not demonstrably superior.

The concept of the damage method has been discussed previously. The feasibility report for the flood insurance program prepared in 1966 addressed both the annual flood damage and the frequency method. The annual damage method was rejected partly "because no completely satisfactory source of countrywide flood damage data existed." In addition, the method lacked "uniformity" in appraising and defining direct and indirect losses. The frequency method was selected as the most viable for the national effort.

One of the authors of the paper "Dealing with Variable Flood Hazard" was a participant in the Floodplain Management Seminar at the University of Chicago in 1968. Among the topics discussed was a variable definition of the floodplain. After much deliberation, the group of experts recommended a standard that was based on flood frequency.

FINDINGS

The responses received were overwhelmingly supportive of the 100-year base flood standard. All sectors, public and private, indicated that the current standard works and represents a workable compromise between too restrictive a standard and too low a level of protection. Suggestions to improve particular applications and regulations associated with the 100-year flood standard were offered. Most of these relate to the National Flood Insurance Program and the Executive Order and will be discussed in the review of Executive Order 11988 and referred to the NFIP for review and consideration.

A few alternatives were suggested; however, none were an improvement over the present standard and did not warrant the disruption, time, and expense that would be involved in changing mapping, regulations, and ordinances at all levels of government. Most responses were not supportive of any change because the costs appeared to far outweigh any benefits.

III. EXECUTIVE ORDER 11988 REVIEW OF IMPLEMENTATION

THE EXECUTIVE ORDER

The origins of Executive Order 11988, Floodplain Management, are found in a Bureau of Budget Study published in August 1966, as House Document 465, "A Unified National Program for Managing Flood Losses." This study sought to identify ways for the Federal Government to arrest flood losses that continued to rise in spite of large expenditures for flood control structures. This study argued the need to utilize nonstructural approaches as well as structural approaches to flood loss reduction. Included among the study recommendations was establishment of a Federal flood insurance program and also an Executive Order directing Federal agencies to carry out flood hazard evaluations before taking actions located in floodplains. The Bureau of Budget study marks the beginning of an 11-year experience leading up to establishment of the current Executive Order 11988, Floodplain Management.

In August 1966, the President issued Executive Order 11296, "Evaluation of Flood Hazard in Locating Federally Owned or Financed Buildings, Roads, and Other Facilities, and in Disposing of Federal Lands and Properties." The Executive Order,

- (1) directed heads of Federal agencies to provide leadership in encouraging a unified effort to prevent unnecessary use of the Nation's floodplains and to lessen the risk of flood losses;
- (2) directed heads of Federal agencies to evaluate flood hazards;
 - (a) when planning the location and construction of new Federal buildings, structures, roads or other facilities;
 - (b) when administering Federal grant, loan or mortgage insurance programs; and
 - (c) when disposing of Federal lands or properties; and
- (3) directed heads of agencies to develop implementing procedures and to certify to the Bureau of Budget that flood hazard evaluations had been carried out for any appropriations requested for Federal construction of buildings, structures, roads or other facilities.

This Executive Order set a policy of Federal responsibility and leadership to reduce economic losses caused by flooding. It was followed in 1968 by passage of the National Flood Insurance Act, which immediately thereafter led to adoption of the 100-year base flood as the standard for implementing the insurance program. In 1972 the 100-year base flood standard of the insurance program was first advocated for use in implementing the Executive Order by the Water Resources Council (WRC) when it adopted "Flood Hazard Evaluation Guidelines for Federal Executive Agencies."

In 1975, the Comptroller General's report "National Attempts to Reduce Losses from Floods by Planning for and Controlling Uses of Flood-Prone Lands" found that Federal Agencies did not adequately evaluate flood hazards in their programs. Specific agencies cited for failure to carry out the flood hazard evaluation directives for Executive Order 11296 included the Department of

Housing and Urban Development, Veterans Administration, Farmers Home Administration, and General Services Administration. A copy of the digest of that report is included in the appendices.

The report also cited the need for placing greater emphasis on providing flood hazard technical assistance through the Corps of Engineers, Soil Conservation Service and Tennessee Valley Authority and monitoring of Executive Order 11296 by the Office of Management and Budget (OMB). It also called for a more effective effort by the WRC to implement the National Program for Floodplain Management as assigned earlier by the Bureau of Budget in response to Congressional direction contained in the National Flood Insurance Act of 1968. In 1976, partly in response to the Comptroller General's criticism, the WRC adopted a Unified National Program for Floodplain Management which recommended revision of Executive Order 11296 to formalize the relationship of the Order to the 100-year base flood standard to be consistent with the standard utilized by the National Flood Insurance Program and communities across the Nation.

As stated in the 1975 report by the General Accounting Office, over the period from 1966 to 1976, Executive Order 11296 proved to have a limited effect in reducing flood losses due to the lack of agency implementing procedures and limited compliance by Federal agencies. However, it did serve to raise awareness that flood losses were a serious national problem and that reduction of those flood losses required the Federal Government to take a leadership role.

In May 1977, the President issued Executive Order 11988, Floodplain Management, which superseded Executive Order 11296. In essence, this Order

- (1) directed Federal agencies to assert leadership in reducing flood losses and losses to environmental values served by floodplains;
- (2) directed Federal agencies to avoid actions located in or adversely affecting floodplains unless there is no practicable alternative;
- (3) directed Federal agencies to take action to mitigate losses if avoidance is not practicable;
- (4) established a process for flood hazard evaluation based upon the 100-year base flood standard of the National Flood Insurance Program;
- (5) directed Federal agencies to issue implementing procedures;
- (6) provided a consultation mechanism consisting of WRC, Council on Environmental Quality, and Federal Insurance Administration (FIA) staff to assist agencies in developing their implementing procedures; and
- (7) provided two oversight mechanisms: certification by Federal agencies to the OMB that proposed actions are in accord with the Order when authorization and appropriations are requested; periodic evaluation of agency procedures and their effectiveness by the WRC.

Since May of 1977, there have been a number of changes in Federal organization or policy that have made certain minor provisions of the Executive Order outdated. These changes include:

- (1) Section 2(a)(1) of the Executive Order references Department of Housing and Urban Development floodplain maps. The responsibility for developing these maps was transferred to FEMA along with the rest of the National Flood Insurance Program in 1979.
- (2) Section 2(a)(3) directs Federal agencies to send public notices regarding floodplain development to the appropriate State and areawide OMB Circular A-95 clearinghouses. Circular A-95 has been replaced by Executive Order 12372 "Intergovernmental Review of Federal Programs." This Executive Order still requires that Federal agencies consult with State and local governments prior to taking actions. This consultation is to be done through individual State developed review processes rather than Federally mandated A-95 clearinghouses.
- (3) Section 2(d) directs Federal agencies to prepare their implementing procedures in consultation with WRC, CEQ, and FIA. Responsibilities within FEMA for providing this consultation are now located within the natural hazards unit rather than FIA.

These changes are not substantive and by themselves would not warrant revision of Executive Order 11988 in the absence of other changes.

In February 1978, the WRC adopted Floodplain Management Guidelines. These guidelines provide a section-by-section analysis of the Order, definition of key terms, and an eight step process for carrying out the Order's directives. The eight-step decision-making process contained in the WRC guidelines incorporates the basic requirements of Executive Order 11988. Briefly, this eight-step process is as follows:

- Step 1 - Determine if a proposed action is in the base floodplain.
- Step 2 - Provide for early public review.
- Step 3 - Identify and evaluate practicable alternatives to locating in the base floodplain.
- Step 4 - Identify the impacts of the proposed action.
- Step 5 - Minimize threats to life and property and to natural and beneficial floodplain values. Restore and preserve natural and beneficial floodplain values.
- Step 6 - Reevaluate alternatives.
- Step 7 - Issue findings and a public explanation.
- Step 8 - Implement the action.

The three agencies providing consultation services used the guidelines in meeting with the more than 50 agencies developing implementing procedures.

These guidelines continue to provide the basic interpretations of the Order although activities of the WRC were cut back to a minimum level in 1982.

As this brief history and description of the Order suggests, the Executive Order and the 100-year base flood standard have evolved together over a 15-year period. The current review of the implementation of the Order and the appropriateness of the 100-year base flood standard is timely and is providing the periodic evaluation called for by the Order.

STATUS OF AGENCY IMPLEMENTING PROCEDURES

Executive Order 11988 requires Federal agencies to issue or amend existing regulations and procedures to comply with the Executive Order within one year. The Executive Order was signed on May 24, 1977, and as a result, regulations and procedures should have been in place by mid-1978. As part of this review, the heads of Federal agencies were asked to verify that regulations or procedures had been adopted and that the procedures listed in the latest Water Resources Council status list were current. Responses were received from all agencies except Department of State, which undertakes few floodplain actions, and the Environmental Protection Agency (EPA). EPA was later contacted by phone. An updated status of agency implementing procedures is attached as Appendix B.

Sixty-three agencies, subagencies, or programs were identified as requiring regulations or implementing procedures. In some instances agencies chose to adopt agency-wide procedures while in other cases agencies chose to develop procedures for individual subagencies or programs. As of February 22, 1983, 54 of the procedures were identified as final or interim/final. The remainder were proposed or draft procedures that had not been finalized. Appendix B lists the following agency implementing procedures that are not final:

Farmer's Home Administration, Department of Agriculture (Proposed, FR, September 14, 1978)

Agricultural Stabilization and Conservation Service, Department of Agriculture (Proposed, FR, March 14, 1980)

Federal Energy Regulatory Commission (Proposed, FR, March 7, 1977)

Department of Housing and Urban Development (Proposed, FR, August 9, 1979)

Bureau of Indian Affairs, Department of Interior (Proposed, FR, October 1, 1979)

Bureau of Oceans and International Environmental and Scientific Affairs, Department of State (Informal Draft, September 1978)

The Department of State did not reply to the FEMA letter to agency heads and, as a result, this list may not reflect the latest status of their procedures. Subagencies of Department of Agriculture and Department of the Interior should at a minimum be implementing existing agencywide procedures until subagency procedures are finalized. The Department of Housing and Urban Development is operating under a general statement of policy published in the

Federal Register on August 14, 1979, pending adoption of Executive Order procedures.

Federal agencies and subagencies have chosen a variety of formats for adopting implementing procedures. Most agencies have adopted regulations that incorporate provisions of the Executive Order and the WRC Guidelines in some detail. Others have used a Secretary's Memorandum, internal directives, design manuals, or agency procedures. These latter formats appear most appropriate for agencies that conduct few floodplain actions or have a limited range of activities which would be covered. Finally, a few have chosen to make amendments to each applicable program regulation. This latter procedure has the advantage of incorporating all requirements of a program under one heading, but has tended to lead to regulations that are overly brief and may not adequately incorporate all Executive Order provisions.

This review did not examine in detail all agency implementing procedures for compliance with the Executive Order and the WRC Guidelines. Such examination exceeded the planned scope of this effort and the resources available. Individual procedures were examined only in response to comments that were received from Federal agencies or in response to the Federal Register Notice. Those procedures that were reviewed range from those that go well beyond the requirements of the Executive Order to several that are barely adequate or have provisions that are clearly inconsistent with achieving the Order's objectives.

ANALYSIS OF COMMENTS

Comments on the Issues and Questions Contained in the Federal Register Notice

In the October 22, 1982, Federal Register Notice, FEMA posed two broad, major questions regarding the Executive Order.

1. Are Federal agencies complying with Executive Order 11988?
2. What impact, if any, has there been on the level of Federal support of unwise actions in designated floodplain areas?

In addition, six more specific questions were asked regarding agency compliance and the effectiveness of the Executive Order in achieving its stated purposes.

1. Are actions going into the floodplain which should not be?
2. Are actions not going into the floodplain which should be?
3. Are flood risks being assessed adequately?
4. Are structures and facilities being adequately protected against the flood hazard?
5. Are actions being delayed as a result of compliance with Executive Order 11988? If so, do benefits result from the extra time taken to review the floodplain aspects of a project?

6. Has there been a change in the level of Federal support for unwise floodplain actions as a result of Executive Order 11988? Why or why not?

Many of the comments addressed both of the issues and the six questions in some detail. Most, however, only made general comments regarding the Executive Order. In addition to responding to the specific questions asked, most comments either expressed support for the Executive Order, suggested modifications to the Executive Order or its application to specific actions, or both. Table III-1 summarizes the responses on the questions posed as well as whether or not the comment supported retention of the Executive Order with or without modifications. Only the comments from non-Federal sources are included in the tabulation.

Issue 1. Are Federal agencies complying with Executive Order 11988?

Fifty-two comments specifically addressed this issue. The 22 comments that indicated that Federal agencies were generally complying were, for the most part, brief and did not provide specific examples. The 28 comments that indicated that agency compliance was mixed went into much greater detail and provided agency examples of compliance or noncompliance. The two comments that indicated that agencies were not complying were, again, general statements and did not include extensive documentation. The comments that reported mixed compliance generally felt that the Executive Order was being implemented for most actions and was being applied to Federal actions with positive results. These comments, however, cite specific agencies that are alleged not to have fully complied with the Executive Order in one or more

Table III-1. Summary of Comments on Executive Order 11988

Responders	1. Are Federal Agencies Complying?			2. What impact has there been on the level of Federal support of unwise actions?			General Support	Support with Modifications or Reservations	Suggest Modifications	General Opposition
	Yes	Mixed	No	Less	No Change	More				
Governors	8	5	1	15	-	-	19	1	-	-
State	11	10	-	16	-	-	18	5	-	-
Local	3	2	1	2	-	-	6	3	-	-
Others	-	11	-	6	1	-	11	1	8	1
Total	22	28	2	39	1	-	54	10	8	1

instances. Some agencies are said to be less aggressive than others in applying the Executive Order to their actions. Other agencies have effectively applied the Executive Order to actions in some programs but not others, or in some field offices but not others. A number of the instances of noncompliance identified were in the few years immediately after issuance of the Executive Order. During this period, agency implementation procedures were being developed and field staff trained. Some of the comments note that Federal agency compliance had been improving and credit this improvement to greater awareness by agency field staff of Executive Order 11988 provisions. A number of the comments emphasize the need for improved agency implementation. They also emphasize the need for continued training and education of agency staff to ensure compliance.

Issue 2. What impact, if any, has there been on the level of Federal support of unwise actions in designated floodplain areas?

Forty comments specifically addressed this issue. Thirty-nine of these comments indicate that Federal support of unwise actions has been reduced in varying degrees as a result of the Executive Order. One comment indicated that there was no change in the number of unwise actions and no comment indicated an increase in that number. There is a consensus that application of Executive Order 11988 has resulted in a reduction in the amount of Federally supported floodplain development as well as an overall improvement in the development that does occur after application of the Executive Order's planning process. The comments also indicate that there remains considerable room for improvements in agency implementation. Federal agencies continue to take some actions in floodplains for which there are practicable alternatives or whose impacts are not reduced to a sufficient degree.

Degree of Support for the Executive Order

The Federal Register Notice of October 22, 1982, did not explicitly request comments on whether or not the Executive Order should be retained or modified. Most of the comments, however, did address this issue and any summary of their contents would be incomplete without presenting this information. Fifty-four comments expressed general support or strong support for retention of Executive Order 11988 or at least issuance of a new Executive Order of comparable scope and restrictions on Federal actions. Ten additional comments expressed support for Executive Order 11988 but suggested modifications to specific provisions or expressed minor reservations about some aspect of its application. These comments generally suggest that provisions be simplified or clarified. These suggestions are dealt with in detail in the discussion of issues that follows. Eight comments do not specifically support or oppose retention of the Executive Order. Each focuses on a specific issue or issues and suggests modification to, or agency interpretation of, Executive Order provisions. A number of comments from the land development industry questioned the application of the Executive Order to what were viewed as private actions with no direct Federal funding involved. A number of comments from the port industry requested modification that would explicitly recognize ports as functionally dependent on floodplain locations and a recognition that there were no practicable alternatives for that location. Both concerns will also be addressed in detail. One comment was negative toward the Executive Order in general although it did not specifically call for its rescission.

The strongest and most unified support for retention of the Executive Order came from the Governors and State agencies that replied. Thirty-seven supported the Executive Order as now written, and in addition six supported it but advised modification of one or more of its provisions or implementing procedures. These comments represent 31 separate States. The most commonly stated reasons for this support can be summarized as follows:

1. The Executive Order prevents Federal agencies from taking actions that would conflict with State water policy. This comment was made frequently by States with strong floodplain management programs.
2. The Order reinforces State efforts to discourage unwise development of floodplains.

In general, these States view Executive Order 11988 as a way of ensuring that Federal agencies thoroughly evaluate the impacts of floodplain actions within their States.

The general consensus of the comments is that Executive Order 11988 be retained and Federal agency implementation improved. There is no indication of opposition to the concept that the Federal Government needs a planning process to carefully evaluate its floodplain actions.

Questions on Substantive Compliance

The six questions regarding substantive compliance contained in the Federal Register Notice were not answered by most respondents. Many of the answers that were received indicated that the questions were misconstrued or subject to a variety of interpretations. As a result, a tabulation of the responses to the questions would be misleading and not fully reflective of the comments themselves. The following summarizes the thrust of the responses that were received as well as additional comments that bear on the questions.

1. Are actions going into the floodplain which should not be?

Many responses indicated that generally they were not. However, many of the responses indicated that agencies were taking, assisting, or allowing some actions that violated the Executive Order. These comments are summarized in detail in the following section.

2. Are actions not going in the floodplain that should?

This question was interpreted several different ways. A majority of the responses indicated that this was not a problem. Several felt that there were insufficient Federal expenditures for delineating floodplains, providing technical assistance for floodplain management, or relocating flood-prone properties. Several comments from the port industry indicated that some privately sponsored construction of port facilities had been abandoned due to the Executive Order but did not provide specific examples.

3. Are flood risks being assessed adequately?

This question was also widely misunderstood. The comments were evenly split between "yes" and "no" answers. The explanations of the "no" answers varied, including:

- o flood data were not available for remote or rural areas;
- o some Federal agencies did not have sufficient on-board technical expertise;
- o flood elevations did not reflect increased run-off due to urbanization;
- o the 100-year standard was too high or too low for a specified type of action;
- o V-zones or riverine high velocity areas were not adequately designated; and
- o some Federal agencies do not aggressively search for flood data if NFIP maps are not available for a location.

The need to develop some form of flood data for remote or rural areas and the lack of technical expertise were the most frequently cited concerns.

4. Are structures and facilities being adequately protected against the flood hazard?

Most of the 24 responses that addressed this question felt that, in general, structures were being protected to at least the NFIP minimum standards cited in the Executive Order. However, NFIP minimum standards emphasize reducing flood damages to structures and do not fully address threats to human safety or preservation of natural floodplain values. For this reason, the fact that structures or facilities generally comply with NFIP standards does not necessarily mean that they are fully compliant with the Executive Order. A few felt that NFIP standards were sufficient for residential structures but too restrictive for industrial and port facilities.

5. Are actions being delayed as a result of compliance with Executive Order 11988? If so, do benefits result from the extra time taken to review the floodplain aspects of a project?

About one-third of the responses indicated that there were no delays that resulted from application of the Executive Order. These comments generally indicated that the review was being conducted concurrently with National Environmental Policy Act (NEPA) compliance or with other project planning. A majority of the responses indicated that there was some delay but that it was beneficial, resulting in facilities that were more resistant to flood damages. Two comments indicated that there were delays and that these delays were not justified by the additional benefits gained. The comments indicate in general that delays due to application of the Executive Order to projects are not of great concern.

6. Has there been a change in the level of Federal support for unwise floodplain actions as a result of Executive Order 11988? Why or why not?

There were 20 comments that addressed this question. Thirteen indicated that there was a noticeable decrease in the number of unwise Federal actions

in the floodplain. However, the comments as a whole indicate that this decrease is not as great as it should be. Seven comments indicated that the number of Federal actions in the floodplain appeared to be about the same. A number of these comments noted that, although there was no noticeable change in the number of actions, the actions that were taken were more adequately protected against flood damages than prior to the issuance of the Executive Order.

Comments on Implementation of Executive Order 11988 by Individual Agencies

Analysis of those comments that address implementation of Executive Order 11988 by individual Federal agencies provides considerable information regarding its effectiveness. The comments focus primarily on a small number of agencies and are not necessarily fully reflective of overall agency implementation.

Executive Order 11988 applies to all Federal Actions including

- (1) acquiring, managing, and disposing of Federal lands and facilities,
- (2) providing federally undertaken, financed, or assisted construction and improvements; and
- (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing.

This definition encompasses a wide range of activities, programs, and statutory authorities. As a result, the problems and opportunities encountered by Federal agencies and their overall success in implementing the Executive Order can be expected to vary significantly. The actions themselves vary from direct Federal construction on Federal property where the agency is in complete control to programs such as loan guarantees and some types of permits where Federal involvement is far more tenuous. In the latter case, the ability of a Federal agency to influence the actions of another level of government or private projects which are privately financed can be limited. It is likely that positive results from application of the Executive Order will be far more discernable in those instances where the Federal agency acted directly.

A higher degree of compliance with Executive Order 11988 would also be expected from those Federal agencies that have authorities or missions that are highly compatible with one or more of the purposes expressed in the order. For instance, the Fish and Wildlife Service and the National Park Service were established in part to preserve habitat and unique natural features. In locating their facilities, they could be expected to locate structures on sites outside of environmentally sensitive floodplains. Other Federal agencies have authorities or programs that could, in specific instances, conflict with Executive Order 11988 admonitions to avoid the floodplain, leaving the agency with difficult choices between competing interests. Elderly housing for instance needs to be located within reasonable walking distance of shopping and public facilities. If the downtown section of a community is in the floodplain, the choice may be between locating elderly housing in the floodplain and, by doing so, jeopardizing the safety of its residents or isolating the elderly far from the center of the community. Similarly, the need to provide emergency services such as police and fire

protection on a daily basis must be weighed against the need for these facilities to be operational during a flood. In these situations, whichever choice the agency makes could be subjected to criticism.

Other factors that could affect the number and type of comments on an individual agency's implementation of Executive Order 11988 include:

- o The most successful examples of Executive Order 11988 implementation are those instances where a decision is made to avoid the floodplain. As agency personnel become more aware of Executive Order provisions, floodplain locations will be proposed less often as alternatives. Agency field staff or the private sector may be less likely to propose projects or alternatives if they would be rejected or eliminated when the Executive Order is applied. As a result, instances of avoidance often will not be documented and may not be reflected in the comments.
- o The numbers of actions vary from agency to agency. Some agencies rarely take actions that impact on floodplains. Other agencies such as HUD, the Corps of Engineers, or FEMA take thousands of actions each year in the floodplain during the normal course of their activities.
- o Programs of some agencies are highly visible and more likely to generate controversy than those of other agencies. Their actions are closely scrutinized by State and local governments, the private sector, and other Federal agencies. Projects proposed by the Corps of Engineers, for instance, are thoroughly reviewed over a period of years by multiple levels of government as well as by a broad spectrum of private sector groups. In contrast, other programs or actions affect only the agency itself and are unlikely to receive public attention.
- o Federal agencies are more likely to provide information on their successes rather than their failures.
- o State agencies, local governments, and the private sector are more likely to report problems they have had with Federal agencies rather than routine applications of the Executive Order. The States are more likely to report failures of agencies to apply the Executive Order or report instances where State intervention was necessary to achieve compliance.
- o A number of the alleged violations of the Executive Order included in the comments appear to have occurred in the time immediately following its issuance. It is to be expected that while agency implementing procedures were being developed and field staff trained, there would be confusion over application of the Executive Order to specific actions. Many comments allege violations, but indicate that a particular agency's implementation of the Executive Order has improved recently.

U.S. Army Corps of Engineers

Twelve comments addressed actions by the U.S. Army Corps of Engineers. One comment commended a Corps District office for providing technical assistance to communities (O-6). One State indicated that placement of dredge spoil by the Corps in that State generally had been good (S-15).

Six comments addressed Corps of Engineers public works projects. A number of large-scale drainage projects in Gulf Coast States were cited in two comments as being inconsistent with the Executive Order (O-34, F-26). One comment indicated that the downstream flooding and cumulative effects of projects were inadequately discussed in project plans and increased run-off often was not considered (O-34). Cited in the same comment was an instance where the Corps of Engineers had not applied the Executive Order to a beach erosion and a hurricane protection project until after the issue was elevated to the Council on Environmental Quality. It was felt, however, that the delay was beneficial and educated all concerned. One State indicated that it often learned of levee projects after they were completed (G-15). One community cited a flood control project which included preservation of a floodway as being in the spirit of the Executive Order (L-4). The Corps of Engineers provided an example of a project that had been dropped because suitable nonstructural alternatives existed. A Federal agency cited a similar project but felt that the Corps' inability to fund the proposed nonstructural alternatives limited the chances for their implementation (F-26).

Six comments addressed Corps of Engineers permitting programs. Two environmental groups cited instances where they felt that permits had been granted that adversely impacted on natural floodplain values (O-20, O-34). One of these groups felt that the issuance of Statewide general permits ignored the Executive Order. A FEMA Region reported that early public notice was being provided and that two permits had been denied based on their input (F-15). A second FEMA Region cited an instance in which the Corps of Engineers issued a permit for stream channelization on the basis that this was the only way to protect the property that was under the Corps of Engineers regulatory jurisdiction. The comment indicates that other alternatives, including the no action alternative, were not evaluated (F-10). This same concern was expressed by a State agency and a Federal agency, both of which cited a number of instances in which it was alleged that alternative actions had not been considered (S-17, F-26). The comments indicate a reluctance on the part of the Corps of Engineers to deny permits based solely on the existence of alternative means to protect properties from flood damage. The issue raised is: For whom should the alternative course of action be practicable - the permitting agency, which could always deny the permit, or the permit applicant, who may have rather limited options if he wishes to develop a particular piece of property?

Environmental Protection Agency

Twelve comments were received that addressed implementation of the Executive Order by the Environmental Protection Agency (EPA). Two organizations cited an EPA action that they regarded as overstepping the spirit of the Executive Order because it appeared to be an attempt to thwart an ongoing private action (O-1, O-21). EPA had refused to allow a developer of floodplain property permission to hook up to an existing sewage treatment plant in Cape May, New Jersey. It was argued that there would be no cost to

the government, the development had prior approval of State and local coastal authorities, and the developer had no really practicable alternatives since he owned the site and he could not abandon it without financial loss. The United States Court of Appeals later ruled in favor of the developer based primarily on the approvals of State and local coastal authorities (Cape May Greene, Inc. vs. Warren et al.). The case may be appealed. The basic issue raised is how strictly should Federal agencies apply the Executive Order to actions where projects are not directly Federally funded. One comment cited this action as evidence of aggressive implementation of the Executive Order by EPA (F-12).

One Federal agency reported instances in which sewage treatment plants were unnecessarily located in floodplains (F-26). One State generally had had good experiences with EPA but felt that reviews of grants to upgrade plants did not always adequately take into account the need for access and the impact of the discharge of raw sewage during a flood on water quality (S-15). Another State felt that EPA did not always adequately use floodway data in site evaluation (S-10).

A community reported instances where EPA required floodproofing of sewage treatment plants (L-10). A FEMA Region reported an instance in which EPA refused to fund sewage treatment facilities that would have serviced a large undeveloped coastal floodplain (F-10). One State indicated that EPA had required that sewer lines be realigned to avoid floodplains (S-14). Another State noted that EPA had encouraged community development of a floodplain management program (S-23). Finally, one State reported general compliance by EPA with the Executive Order (S-33).

Federal Emergency Management Agency

A number of comments recommended that FEMA ensure that Federal agencies not exceed their authorities or make unreasonable use of the Executive Order to delay or stop private development (O-5, O-8, O-25, O-21). Most of these comments were concerned about what were regarded as too restrictive application of the Executive Order to what were primarily private actions. One State felt that FEMA should make a greater effort to educate industrial developers and the port industry regarding the Executive Order and the NFIP (S-16). A number of responses contained inquiries about the status of the report entitled "Effect of Flood Plain Regulation on Inland Port Facilities," which addressed the Executive Order and NFIP floodplain management regulations (O-33, O-4, O-5). The implication of these comments was that the delay in publication represented an attempt to suppress the report. The report was printed in January 1983 and has been distributed to these parties.

Eight comments addressed compliance with Executive Order 11988 by the National Flood Insurance Program. One comment from an environmental group felt that the program was not being administered forcefully enough (O-34). One State felt that since NFIP performance standards only prohibited encroachments into floodways and required that structures be elevated or otherwise protected against flood damage, they were inconsistent with the Executive Order. Fill in the floodplain, construction of levees, and stream channelization were tolerated and resulted in destruction of natural floodplain values. In addition, practicable alternatives were not being considered (S-16), an issue also raised by a Federal agency (F-21). That agency also felt that FEMA's practice of issuing Letters of Map Amendment removing properties from the floodplain, if the developer could protect the structures

from flood damages, conflicted with attempts by other Federal agencies to avoid floodplains while conducting housing programs. One State felt that NFIP standards did not comply with Executive Order 11988 because they did not require regulation of road access to properties or provide specific standards for on-site sewage treatment or storage of materials and equipment (S-15).

Two comments questioned NFIP regulations that in essence prohibited expansion of a liquid bulk storage facility into the floodway of the Ohio River. Construction of the facility would have increased upstream flooding. The comments indicate that bulk storage facilities should be considered functionally dependent on a waterfront location and should be exempt from this NFIP regulation (O-18, O-31, O-33). FEMA's position has been that bulk storage facilities do not need to be located near water although the offloading part of the facility does. The latter could be designed to not increase upstream flood elevations and could be permitted. A FEMA Region felt that flood insurance claims payments should be subject to the Executive Order and as a result placed under the same restrictions as the various forms of disaster assistance (F-15). These payments had been categorically excluded on the basis that the flood insurance policy was a contract between the individual and the government.

Two States recommended that additional funds be available for relocation of structures or facilities out of the floodplain after declared disasters. They felt that very little could be done to reduce flood damages under existing disaster assistance programs because of the limits on funds available for mitigation (S-22, S-28). One FEMA Region reported that the Executive Order has been useful in reviewing applications for disaster assistance (F-18). Two FEMA Regions questioned the cost/effectiveness of applying the 8-step process called for in FEMA implementing procedures to all of the thousands of disaster assistance actions processed during a declared disaster (F-12, F-13). One of the Regions provided statistics that showed that there were only limited opportunities for avoidance or even mitigation when dealing with the repair of minor damages to facilities. FEMA's procedures had exempted those actions under \$5,000 that were not located in floodways or coastal high-hazard areas and were not substantial improvements. There is a feeling that higher thresholds could be introduced with only minimal effect on the amount of mitigation that occurs. This would allow more effort to be expended on review of actions that had greater potential for mitigation. A copy of an internal FEMA analysis was obtained which verified that there were minimal opportunities for avoidance for small actions. For further discussion of this analysis see the section on thresholds that follows.

Department of Housing and Urban Development

Thirty-five comments addressed HUD implementation of Executive Order 11988. They represent by far the largest number and most in-depth set of comments on any agency. This disparity results in part from a number of factors:

- HUD conducts a far larger number of individual actions in the floodplain than any other agency.
- HUD programs tend to be highly visible and generally require the involvement of State and local government as well as the private sector.

- o For programs such as those for elderly housing or Community Development Block Grants there are differences of opinion as to how the Executive Order should be applied.
- o HUD has not yet adopted final agencywide implementing procedures.

General Comments

Eight comments express general satisfaction with the manner in which HUD field staff had applied the Executive Order to actions. These comments either cited instances in which funding had not been approved for a project or indicate that HUD field staff routinely check with other agencies when evaluating floodplain actions (S-9, S-26, O-32, L-32, S-33, S-22, L-17, S-15). Three additional comments indicate that, while there had been initial problems with compliance, the awareness of the Executive Order by HUD field staff had greatly improved (F-11, F-14, S-33). One comment reported that HUD staff had encouraged a community to practice sound floodplain management (O-6).

Six comments reported instances in which, or felt in general that, HUD field staff had not applied the Executive Order to actions or were not aware of its provisions (S-18, O-15, S-19, F-15, G-3, S-14). Two comments felt that public notices regarding HUD projects were received too late in the planning process to influence decisions (S-1, G-3). One comment indicated that HUD had not fully considered inputs that had been provided (G-3).

Community Development Block Grants

There were a number of comments that addressed Community Development Block Grants (CDBG). Section 9 of Executive Order 11988 delegates to applicant communities responsibility for application of the Executive Order if the community has assumed responsibility for NEPA compliance. Two comments cited situations in which a community had used CDBG funds to acquire floodplain property. The community then could apply to HUD and other Federal agencies for other forms of Federal assistance. When HUD or another agency applied the Executive Order to these additional actions, avoidance of the floodplain would be difficult to achieve since CDBG funds had already been expended to acquire the flood prone property (O-6, S-14). One additional response recommended that responsibility for Executive Order compliance for CDBG be assigned to HUD (F-15).

Two states and one FEMA Region addressed a recent HUD Office of General Counsel opinion that Sections 102 and 202 of the Flood Disaster Protection Act of 1973 are not applicable to the CDBG Small Cities Program. The program is said to be a formula grant and as such is not included in the Act's definition of financial assistance. Under this interpretation, funds could be used for acquisition or construction in flood hazard areas of communities that are not participating in the National Flood Insurance Program. In addition, flood insurance coverage would not be required on structures built using CDBG Small Cities Program funding. Both comments indicated that this interpretation encouraged unwise floodplain development and was contradictory to the intent and purposes of the National Flood Insurance Program (S-31, G-7, F-11).

Other comments on the Community Development Block Grant Program include:

- o Two States indicated that their HUD field offices routinely check CDBG applications for Executive Order compliance (S-22, O-32).
- o One State noted that the "Notice of Explanation" for floodplain actions developed by communities was generally inadequate (G-19).
- o One State felt that CDBG applications circulated for review did not adequately address flood problems (S-10).
- o One city was willing to assume responsibility for Executive Order application for CDBG's but had problems applying the concept of "practicable alternative" to its already developed waterfront (L-28).
- o One comment alleged that the State project officer for the Small Cities Program was unaware of Executive Order provisions (F-10).

Housing for the Elderly

Eleven of the comments addressed housing for the elderly. HUD has considered housing for the elderly to be a critical action (an action necessitating consideration of the 500-year floodplain) only in those instances in which the project is primarily designed for the handicapped. Most of the commentators feel that elderly housing should be treated as a critical action in nearly all cases. The presumption is that many elderly have limited mobility and are more likely to require emergency medical assistance during a flood than the population as a whole. If elderly persons are isolated in a structure by floodwaters, utilities are cut off and emergency vehicles cannot reach the structure. The thrust of the comments is that this poses an unacceptable risk to human safety and as a result provision of 500-year protection is warranted. (S-14, O-6, G-3, F-14, F-12, G-5, F-15, G-11, S-33, L-17, S-9).

The comments in general indicate that at a minimum 100-year flood protection is being provided. A more specific discussion of the comments follows:

- o One State indicated that housing for the elderly and handicapped continues to be placed in the floodplain; 500-year level access to one structure was provided only in response to their comments. They felt that this practice created an added dimension to a flood disaster and was an unnecessary risk (G-3).
- o One State cited an instance in which housing for the elderly and handicapped was to be located in a coastal high-hazard area (V Zone). The State had to point out the need for an evacuation plan and specialized foundation work (G-5).
- o One State cited an instance in which a project was planned for a coastal high-hazard area (V Zone) on a barrier beach. The site would be isolated from the mainland during a storm and would be without utilities for up to two days. Alternative safe sites were available (S-14). This situation was also cited by a Federal

agency and is now being litigated. The State also cites another instance in which a project would have limited access during a flood; however, alternative sites were not considered.

- o One FEMA Region reports an instance in which a nursing home was to be located in a floodplain and 100-year protection provided. The 500-year flood elevation was 10 feet higher. There was no documentation to indicate that alternatives had been examined (F-10). This project is now being litigated.
- o One State credits HUD with refusing to fund a project that would be located in a flash flood area (S-33).
- o Two comments indicate that HUD field staff appear to be applying the Executive Order to elderly housing (L-17, S-9).
- o One FEMA Region reports instances in which housing projects encroached on the floodway of a stream (F-15).

Federal Housing Administration Approval of Subdivisions

Three comments addressed Federal Housing Administration (FHA) approval of subdivisions for FHA-insured mortgage loans. One FEMA Region reported that Environmental Impact Statements on these subdivisions now routinely set aside floodplains as open space (O-32). A Federal agency reports an instance in which FHA approved a subdivision protected by an inadequate levee. The subdivision was flooded and the Corps of Engineers is now exploring the feasibility of a flood control project. The same agency and a Flood Control District felt that FHA could be encouraging the filling of floodplains and floodplain development by approving subdivisions that contain flood prone properties (F-26, L-7). Under the National Flood Insurance Program, a developer can submit plans to add fill, channelize a stream, or otherwise protect an area from flooding. Based on these plans, FEMA can provide a letter indicating that the subdivision's structures will be removed from the floodplain once the flood control work is complete. By removing the structures from the floodplain, flood insurance is no longer required and the properties are easier to sell. FHA has been approving these subdivisions for FHA financing on the basis of the preliminary FEMA determination that they would no longer be designated as floodplain. The Flood Control District feels that these actions are counter to Executive Order 11988 and also provide private developers with the leverage to pressure local units of government to approve floodplain subdivisions (F-28, L-7).

Department of Transportation

Twelve comments relate to the Department of Transportation (DOT) implementation of the Executive Order. Two environmental groups addressed the replacement of the Dauphin Island Bridge using DOT funds after it was destroyed by Hurricane Frederick in 1979. They alleged that this action was inconsistent with the Executive Order since there were alternatives available (i.e., a ferry) that would not have encouraged additional development (O-9, O-20). The decision to replace the bridge was litigated, primarily on the basis of NEPA rather than the Executive Order, and DOT funding of the project was upheld.

Two comments reported instances in which road and railway alignments had been chosen that significantly encroached on floodplains. In both cases it is alleged that alternatives were available that would have reduced this impact and not increased costs (F-26, O-34). Four comments addressed Federal Highway Administration's (FHWA) funding of construction of bridges that encroached on floodways or caused increases in upstream flood elevations that were unacceptable to the agency commenting (S-15, F-14, F-15, F-17). Most of the comments also noted that there had been significant improvements in the working relationships between FHWA and the State or agency and that application of the Executive Order had resulted in modifications in bridge designs that reduced their impacts on flood elevations. Three comments credit FHWA with generally working closely with States and other agencies in complying with the Executive Order (G-15, S-13, S-33). One State indicated that highway projects still appeared to violate the Executive Order (S-11).

Other Agencies

Department of Agriculture - Farmers Home Administration

Five comments addressed Farmers Home Administration (FmHA) actions. Two States questioned whether FmHA identified the exact locations of some of the structures that it financed (S-18, G-11). One State credited FmHA with giving full consideration to the Executive Order in its actions (S-22). One Federal agency cited an instance in which FmHA refused to fund elderly housing where access during a flood could not be provided (S-33). Cited in one comment was an instance in which FmHA had required that renovated housing be floodproofed (S-23).

Department of Agriculture - Soil Conservation Service

Three comments addressed Soil Conservation Service (SCS) actions. One comment cited two instances where it was alleged that SCS drainage projects conflicted with Executive Order provisions and paid insufficient attention to non-structural alternatives for flood control (O-34). One State felt there was insufficient tie-in between floodplain management regulations and a PL-566 project (S-10). One community alleged that SCS field staff had been overzealous in attempting to block construction of an industrial park in the floodplain which had not been objected to by other agencies (L-27).

Department of Commerce - Economic Development Administration

Department of Commerce cited an instance in which the Economic Development Administration (EDA) had required an Indian tribe to select a nonflood-prone location prior to funding a project and an instance in which it was found that there was no practicable alternative to locating an industrial park in the floodplain.

Department of Defense

Department of Defense reported nine instances in which Navy facilities were constructed or relocated out of the floodplain in accordance with the Executive Order.

General Services Administration

One comment indicated that the General Services Administration (GSA) had complied with the Executive Order in one instance of disposal of Federal property (F-12).

Department of Health and Human Services

Two comments were received that addressed actions by the Department of Health and Human Services (HHS). One comment credited the Public Health Service with checking for Executive Order compliance prior to approving funds for hospital equipment acquisition (O-32). The other comment cited an instance in which the Administration on Aging had required that a community select a structure that could be adequately floodproofed for its Senior Citizens' Club (S-23).

Department of Interior - Bureau of Indian Affairs

Two comments were received that addressed Bureau of Indian Affairs (BIA) actions. One comment credited BIA with attempting to relocate Indian families out of the Minnesota River floodway (O-6). One State felt that BIA had not notified the State of proposed floodplain actions in a timely manner (G-15).

Department of Interior - Bureau of Land Management

The Bureau of Land Management (BLM) reported as an example that it had been reviewing lease renewal applications in Arizona for Executive Order compliance. The agency also reported its involvement in the modification of a community college project to reduce flood damages.

Department of Interior - Fish and Wildlife Service

One State cited an instance in which the Fish and Wildlife Service (FWS) had blocked a stream dredging project that was designed to reduce flood damages (O-13). FWS reported eight instances in which wildlife refuge structures or facilities were relocated out of the floodplain, six instances in which alternative locations out of the floodplain were selected for structures or facilities, and six instances in which structures or facilities were floodproofed.

Department of Interior - National Park Service

The National Park Service (NPS) reported three instances in which special steps were taken to comply with the Executive Order in areas subject to hazards due to flash floods.

Department of Labor

One State reported an instance in which Department of Labor had applied the Executive Order to a proposal for migrant housing. The floodplain was determined to be the only feasible location, but the project was modified to minimize flood damages (S-23).

U. S. Postal Service

Two comments were received regarding Postal Service actions. One comment indicated that the Postal Service has built several new facilities in the floodplain, but has begun to seek out flood data to assist in locating post offices (O-32). One comment from a FEMA Region indicated that the Postal Service was working with FEMA to place flood highwater marks on post offices (F-11).

Small Business Administration

Three comments noted that the Small Business Administration (SBA) did not appear to have a system for ensuring that recipients of disaster loans purchased and maintained flood insurance coverage as required by the Flood Disaster Protection Act of 1973 (O-15, S-18, S-28). One of the comments also suggested that SBA require proof of compliance with local floodplain management building standards before disbursing a loan (S-28). One FEMA Region expressed concern that SBA had established a policy exempting loans of less than \$300,000 from the Executive Order 11988 review process (F-16). This high threshold is felt to result in numerous lost opportunities to reduce flood hazards. The example provided was a mobile home park for which loans were provided but the Executive Order never applied despite major damages. Similar concerns regarding SBA's \$300,000 threshold have been raised by other FEMA regions prior to this review.

Tennessee Valley Authority

One environmental group alleged that a Tennessee Valley Authority (TVA) reservoir project was inconsistent with the Executive Order (O-34). TVA reported a number of actions which had been modified as a result of application of the Executive Order process. These actions include the refusal to sell an easement for a coal facility, a change in location for a power substation, changes in highway fill projects that require TVA approval, and the floodproofing of a TVA-owned uranium mining project.

Veterans Administration

One FEMA Region indicated that the Veterans Administration (VA) was complying with the Executive Order when it approved subdivisions for eligibility for VA mortgage guarantees (F-10). The VA reported that it had floodproofed a hospital.

COMMENTS REGARDING EXECUTIVE ORDER 11988 PROVISIONS

The Federal Register Notice of October 22, 1981, requested comments on agency compliance with Executive Order 11988 and on the impacts of the Executive Order on floodplain development. In addition many of the comments recommended changes to the Executive Order or raised issues regarding its interpretation. This section examines these recommendations and issues in some detail. Most of the changes and issues raised can be categorized into three broad areas - those that deal with coverage of the Executive Order, those regarding avoidance and practicable alternatives, and those that address the relationship between the Executive Order and the National Flood Insurance Program. A number of other issues are also discussed. Some comments raised

addressed directly but, as facets of larger issues, are addressed within the broader context.

Coverage of the Executive Order

Executive Order 11988 requires that each agency provide leadership and reduce the impacts of flooding while carrying out the following responsibilities:

- (1) acquiring, managing, and disposing of Federal lands and facilities;
- (2) providing Federally undertaken, financed, or assisted construction and improvements; and
- (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.

This list of actions includes a wide variety of activities and program that can range in size and scope from an expenditure of several dollars to one of a billion dollars or more. The WRC Guidelines do permit the carrying out of the eight-step process in fewer steps if all of the objectives of the Executive Order can still be achieved.

Although there appears to be general agreement that Executive Order 11988 is highly beneficial and cost/effective overall, a number of Federal agencies questioned its application to small actions. In particular the requirements for public notice were viewed as burdensome for actions which offered limited opportunities for reducing damages or would have a limited impact on the floodplain and which were likely to generate little or no public comment. It was generally felt by these agencies that their limited resources would be better utilized if focused on larger actions for which planning could result in avoidance of the floodplain or significant reductions in damages or in impacts on the floodplain. Most of the comments indicated that this would result in more-effective implementation of the Executive Order. Recommendations for accomplishing this include use of dollar or size thresholds; widespread use of categorical exclusions; elimination of the public notice requirements, depending instead on provisions of the NEPA; and use of a system of areawide compliance to cumulatively review small actions.

Thresholds

A number of Federal agencies have suggested or adopted thresholds as a means of reducing the administrative burden of applying the Executive Order to these small actions. These thresholds are either a dollar amount or an established size or level of impact. In all cases the rationale for establishing thresholds is the cost/effective application of the Executive Order to those actions which rarely provide opportunities for avoidance of floodplain locations or impacts. However, there is less agreement among agencies on the level or type of threshold or on how to apply the Executive Order to actions that fall below the threshold that is established.

Many of the comments regarding the establishment of thresholds originated from FEMA Regional Offices (F-10, F-13, F-14, F-15). FEMA adopted implementing procedures that included an exemption from applying some steps of the

eight-step process to repairs under Section 402 of the Disaster Relief Act that were less than \$5,000 except for actions in floodways or coastal high-hazard areas and new and substantially improved structures or facilities. Actions that fell under the \$5,000 threshold were required to be disaster-proofed (protected against known potential hazards) in accordance with existing regulations.

Nearly all FEMA actions are taken in the aftermath of Presidentially declared disasters. Typically, several thousands of actions must be processed within several months with the emphasis on timely delivery of assistance to individuals and communities. A number of FEMA Regions felt that the application of the full eight-step process to these numerous small actions was not only burdensome but also interfered with the delivery of assistance. These actions seldom provided opportunities to reduce damages or impacts on the floodplain. In addition, the high thresholds established by SBA and FEMA's categorical exclusion of repairs to existing facilities were viewed as placing FEMA in the politically difficult position of having to justify its low thresholds to applicants for assistance.

An internal review of this issue was completed by FEMA on March 1, 1982, using a data base of 4,000 Damage Survey Reports. This review concluded that although hazard mitigation efforts were generally effective, practicable alternatives seldom could be identified for smaller actions which generally consisted of repairs to public buildings or facilities. Then a number of possible threshold levels ranging from \$10,000 to \$100,000 were tested against the data base. As a result of this review, FEMA developed a proposed rule raising the threshold to \$25,000 except in floodways, in coastal high-hazard areas, or in the case of substantial improvements of structures or facilities. Below \$25,000 and above \$5,000 FEMA would identify the impacts of actions and attempt to minimize those impacts by applying steps 1, 4, and 5 of the eight-step process used for larger actions. In other words, nonfloodplain sites would not be sought, but minimization of harm to and within the floodplain is still required. Below \$5,000 the formalized review process would not be required, but projects or facilities would be disaster-proofed in accordance with existing FEMA regulations. It was estimated that use of these thresholds would have reduced the number of actions that received the full review by 56 percent and, by doing so, have expedited the delivery of assistance. The reduction in the dollar value of the actions that were discontinued or relocated out of the floodplain would have been only 3.5 percent. Higher thresholds that were tested resulted in significantly greater losses of opportunities for mitigation. Lower thresholds resulted in only a small increase in the dollar value of projects with mitigation opportunities realized.

The rationale used to develop the proposed new thresholds appears to be sound. These limits appear to be set low enough to require full application of the Executive Order to all actions in which there is a potential to select practicable alternatives to floodplain actions. In addition, by requiring the identification and minimization of impacts for smaller actions, it would achieve the objectives of the Executive Order. Since the proposed thresholds are fully consistent with the findings of this section, their adoption need not be delayed.

The adoption of thresholds as a means of reducing the administrative burdens of Executive Order compliance can result in abuses, however, that

defeat the purposes of the Executive Order. The SBA exempts all actions for loan assistance of \$300,000 or less and repairs to damaged structures that are less than 50 percent of fair market value. By exempting these actions, SBA in effect has exempted itself from applying the Executive Order to the bulk of its actions. The SBA response to this review did indicate that in postdisaster situations it only approved loans if flood insurance and local permits could be obtained. The high SBA threshold is clearly inconsistent with provisions of the Executive Order. Actions that approach \$300,000 can have significant impacts on public safety and can result in flood losses and the destruction of natural and beneficial floodplain values.

One comment cited the FHWA's threshold as also being set so high that most actions were exempted from much of the Executive Order and opportunities for reducing flood damages or minimizing impacts on the floodplain were lost (F-15). FHWA limits application of the public notice requirements and the need to evaluate practicable alternatives to those actions that are "significant encroachments" (23 CFR 650). "Significant encroachments" are defined to include actions represent:

- (1) a significant potential for interruption or termination of a transportation facility which is needed for emergency vehicles or provides a community's only evacuation route,
- (2) a significant risk, or
- (3) a significant adverse impact on natural and beneficial floodplain values.

According to the supplementary information that accompanied publication of the FHWA regulations, "significant" is used in the same sense that it is used in FHWA environmental review regulations. FHWA in its comments to this review suggests that a similar threshold be incorporated into the Executive Order itself as a means of reducing administrative burdens. Comments which were received that address FHWA implementation of the Executive Order were mixed, but did not indicate any widespread dissatisfaction with the manner in which FHWA had applied the concept of significant encroachment to its actions. However, as defined, the concept could lead to abuse. It could be used to exclude from consideration relatively large projects resulting in actions that are inconsistent with the objectives of the Executive Order.

The establishment of dollar or other thresholds should be regarded as a reasonable means of reducing the administrative burdens created by application of the Executive Order. The need to apply the full review process to numerous small actions may actually reduce its overall effectiveness by preventing agencies from focusing their limited resources on larger actions that offer genuine opportunities for avoidance on the floodplain. If an agency chooses to adopt thresholds for its actions, these thresholds and their use must be consistent with achieving the objectives of the Executive Order. The effect of adoption of thresholds should clearly be to eliminate from application of the full review process only those actions that are highly unlikely to provide meaningful opportunities for floodplain management. These types of actions could include, for example, minor repairs or modifications to existing structures or facilities and actions that are so small that they are unlikely to have a discernable impact on the floodplain. In addition,

- o thresholds should be used as a means of identifying actions for which it is appropriate to apply simplified procedures, not as a means to exempt actions from the Executive Order;
- o all actions, at a minimum, should be reviewed to determine if they are to be located in a floodplain;
- o the impacts of all actions below the threshold need to be identified and minimized to the degree practicable;
- o thresholds of a high dollar amount that would permit construction of new structures or major repairs or modifications to existing structures or facilities are not consistent with the objectives of the Executive Order;
- o a common threshold for all activities in all agencies is not practical due to the tremendous diversity in size and type of Federal actions; and
- o there should be some uniformity of thresholds between similar programs administered by different agencies. Mortgage assistance programs and similar disaster assistance programs in particular should have consistent thresholds.

Thresholds can be a useful tool in improving the cost/effectiveness of applying the Executive Order to agency actions. Thresholds should only be used, however, in instances in which the objectives of reducing the risk of flood loss; minimizing the impacts on human safety, health, and welfare; and restoring natural and beneficial floodplain values will not be compromised.

Categorical Exclusions

The Department of Housing and Urban Development suggested that Federal agencies be provided authority to exclude categorically existing construction from provisions of the Executive Order. The HUD proposal specifically states:

Federal Departments should be provided authority to exclude categorically existing construction except for complying with reasonable standards for floodproofing to be established by the NFIP for administration at the community level. Privately/owned existing housing does not lend itself to the Executive Order's more stringent procedures and standards that Federal agencies apply to Federally-owned buildings or that Federal programs apply to Federally-assisted proposed new construction. NFIP floodplain management criteria administered by communities should be expanded to require reasonable standards for floodproofing all existing buildings located in FEMA designated flood hazard areas as a basis of eligibility for any form of direct or indirect Federal assistance.

The supporting documentation attached to the HUD comments contains an additional proposal for categorical exclusions for HUD activities for which compliance with the Executive Order or application of the eight-step planning process outlined in the WRC Guidelines was deemed to be not meaningful or practicable. This list included

- (1) FHA mortgage insurance on 1 to 4 units of single-family housing;
- (2) secondary-market purchases (Government National Mortgage Association);
- (3) interstate land sales registration;
- (4) rehabilitation and modernization projects;
- (5) disposition activities;
- (6) planning assistance loans and grants; and
- (7) interim assistance and emergency activities.

These proposed individual categorical exclusions are discussed below.

The issue of categorical exclusions has been a point of controversy between HUD and the consulting agencies (WRC, CEQ, and FEMA) for several years. The consulting agencies' position has been that the Executive Order provides no authority for totally exempting these kinds of actions from its provisions. While the HUD position that the application of the full eight-step process to many of these actions was not meaningful or practicable has some merit, excluding these same actions from all provisions of the Executive Order would clearly violate the intent of the order and not contribute to achieving its objectives. The WRC Guidelines provide for carrying out of the eight-step process in fewer steps "...if all of the objectives of the decision-making process can be achieved." This provision is a recognition that there are parts of the process that cannot be applied to some programs or some categories of action. While it would be easier to categorically exclude such actions, this would be inconsistent with the intent of the Executive Order since cumulatively these actions can have an enormous impact on the level of the nation's flood damages and result in significant adverse impacts on the floodplain. For this reason many of these actions are specifically mentioned in the Executive Order itself.

Most of the proposed categorical exclusions provide opportunities for carrying out actions in manners which are consistent with the Executive Order. The proposed exclusions include FHA mortgage insurance on 1 to 4 family housing. FHA commonly refuses to insure mortgage loans for homes that are damaged by termites or violate safety codes unless adequate repairs are made. It would seem consistent with this practice not to insure mortgage loans on structures that are subject to repeated damage by floods unless those structures are upgraded to reasonably reduce the frequency and amount of these damages. Failure to do so only results in perpetuating the existence of these structures and a continuation of the cycle of flood damage and reconstruction with much of the cost financed by other Federal programs such as the NFIP or disaster assistance. The secondary mortgage market purchases by the Government National Mortgage Association may be an appropriate candidate for a categorical exclusion provided that the Federal agency that guarantee or insured the mortgage loans had applied the Executive Order. Application of the Executive Order to interstate land sales registration could result in a decision that Executive Order compliance could be achieved by strengthening the disclosure requirements that relate to flood hazards to which subdivisions are exposed.

The rehabilitation and modernization of housing that is subject to repeated flooding can significantly increase the value of the structure at risk and, as a result, greatly increase the loss potential. Rehabilitation of such housing may prove to be a poor investment since flood-prone neighborhoods may continue to deteriorate unless steps are taken to minimize flood damages. Similarly, the disposition of 1 to 4 family residences that are subject to repeated flooding or which would pose a safety hazard would not be appropriate without taking steps to reduce the severity of the hazard. The Executive Order specifically addresses this disposal of Federal property. Application of the Executive Order to planning grants or loans could be accomplished by a requirement that such plans address ways of achieving the objectives of the Order if appropriate. Finally, interim assistance and emergency activities are proposed as a categorical exclusion. Application of the Executive Order to these activities need not interfere with their delivery. Programs providing such assistance, however, should be structured so that they are consistent with the spirit of the Executive Order even if the full planning process is not applied to each specific action. Since most of these proposed actions provide opportunities for carrying out actions consistent with the objectives of the Executive Order, they should not be categorically excluded from its application.

As an alternative means of Executive Order compliance, HUD also proposed that floodplain management standards implemented by communities participating in the NFIP be expanded to require the floodproofing of all existing structures in FEMA-designated flood hazard areas as a basis of eligibility for any form of direct or indirect Federal assistance. This approach does not appear to be practicable. NFIP floodplain management standards are implemented by local units of government through the adoption of zoning ordinances or building codes. This exercise of the police power is generally not applied retroactively to existing structures except when they receive major damages or are substantially improved. It is questionable whether such a requirement could be legally enforced and there is a high probability that its implementation could force communities out of the program by making the requirements for eligibility too costly. It would appear to be more appropriate to require the floodproofing of individual structures as a condition of receiving Federal assistance when that assistance is applied for by the individual property owner.

The comments cited one instance in which a Federal agency had incorporated a categorical exclusion into its procedures that exempted many of its actions from the Executive Order (F-15). Farmers Home Administration has excluded normal farm operations and repairs to existing facilities from its definition of actions to which the Executive Order must be applied. While which actions constitute normal farm operations is unclear, the exclusion of repairs to existing structures appears to be in clear conflict with the objectives of the Executive Order. It also puts other agencies involved in a Presidentially declared disaster in a compromising position since they may require complete application of the Executive Order to similar actions.

Broad categorical exclusions from Executive Order provisions are not an appropriate method of reducing the burden of Executive Order compliance. The Executive Order now applies and should continue to apply to all Federal actions in floodplains. The use of thresholds or categorical exclusions is appropriate to identify actions that could be adequately addressed when deciding whether to carry out the decision-making process in low flood risk areas.

eight-steps provided in the WRC Guidelines. By using this approach, the administrative burdens created by the Executive Order can be minimized without the loss of meaningful opportunities to reduce the impacts of Federal actions on floodplains.

Public Notice Requirements

The Executive Order requires that Federal agencies provide the opportunity for early public review of any plans or proposals for actions in the floodplain. The order requires that this public notice be provided even for those actions which do not require preparation of an Environmental Impact Statement under Section 102(2)(c) of NEPA and that public notices be compatible with Section 2(b) of Executive Order 11514. Section 2(a)(2) of Executive Order 11988 also requires that agencies prepare and circulate a notice containing an explanation of why the action is proposed to be located in the floodplain. These requirements are referred to as "Early Public Notice" and "Notice of Findings and Public Explanation" in the WRC Guidelines.

The intent of these requirements was to ensure that the general public and interested agencies had the opportunity to provide input regarding proposals for actions in the floodplain. The thrust of a number of the comments from Federal agencies was that these requirements were burdensome when applied to small actions and did not result in any significant degree of genuine public involvement in the decision-making process. The Office of Ocean and Coastal Resources Management (OCRM) of the Department of Commerce proposed that the public notice requirements be eliminated for small and routine actions without endangering the effectiveness of the Executive Order. In support of this proposal, OCRM cited a cost of approximately \$300 per notice, and the receipt of only one response to all such public notices on small projects. The Department of Energy and HUD also indicated that public notice requirements were burdensome and could be eliminated for small actions. Both agencies suggest as an alternative the exclusive use of the NEPA process for public notification and review. This change would require a revision to the text of Executive Order 11988 since it specifically requires public notices for actions that are not covered by NEPA. The public notice requirement was also considered burdensome by most of the Federal agencies that proposed the establishment of thresholds below which the Executive Order planning process could be modified. (See the preceding sections on Thresholds and Categorical Exclusions.)

Public notice requirements were not of general concern to commentators other than Federal agencies; however, one response indicated that publication in the Federal Register or in a newspaper public notice column was not adequate since neither was read by the public at large (O-32). The State of Alaska also indicated that this type of notice did not work in remote areas of the State. Another State emphasized the need for greater State and local input in the process (G-3).

The Federal agency comments indicate that there is a need to clarify the relationships between the NEPA and Executive Order 11988 processes. The Executive Order directs agencies to the extent possible to utilize existing processes, such as those of the Council on Environmental Quality and the Water Resources Council, to fulfill the requirements of the Order. For many actions, most of the steps contained in the eight-step process could be accomplished as the agency complies with the National Environmental Policy Act

of 1969 (NEPA) without additional delays or cost. Federal agencies have been encouraged to use the NEPA process whenever possible.

There are, however, some significant differences between the requirements of Executive Order 11988 and those of the National Environmental Policy Act. These differences are substantial enough that there was a need to issue a separate Executive Order rather than depend solely on NEPA processes. Although Executive Order 11988 is based in part on authorities derived from NEPA, it was also issued in furtherance of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973, the legislation that governs the National Flood Insurance Program (NFIP). In addition the Order builds on concepts contained in a Unified National Program for Floodplain Management developed by the Water Resources Council (WRC). As a result, the Executive Order is strongly oriented toward reducing flood losses and Federal expenditures for repair of Federal facilities, flood control, and various forms of disaster assistance as well as reducing threats to human health and safety. These concerns go well beyond those traditionally evaluated through the NEPA process.

The Executive Order requires the head of an agency to, prior to conducting an action, find that "the only practicable alternative consistent with the law and with the policy set forth in this Order requires siting in a floodplain." Furthermore, if the agency head makes this finding the action must be modified to minimize harm to or within the floodplain. This requirement for a separate floodplain finding is a more stringent requirement than under NEPA. NEPA requires Federal agencies to identify and evaluate the environmental impacts of proposed actions and alternatives during the project planning process. When adverse environmental impacts are identified, the agency must act to avoid or eliminate these impacts. However, there is no requirement similar to the Executive Order finding that there are no practicable alternatives to a floodplain location. Executive Order 11988 can apply this more stringent requirement because floodplains can be delineated using engineering methods with reasonable accuracy. The frequency and magnitude of the potential impacts can be quantified along with the economic losses and increased Federal expenditures that could result due to unwise development. Generally, floodplain impacts can be identified and quantified more readily than many of the other environmental impacts evaluated under NEPA.

Finally, the Executive Order must be applied in its entirety to actions whose impacts may not be "significant" under NEPA criteria and would not require the preparation of an environmental impact statement under Section 102(2)(C) of NEPA. For example, an environmental impact statement probably will not be prepared for a single structure built in a floodplain yet that structure could be exposed to serious flood hazards and could have considerable impact on the floodplain. Executive Order 11988 was applied to all Federal actions to avoid this type of situation. These actions which fall below NEPA thresholds cumulatively could result in significant increases in the nation's flood losses and increased Federal expenditures for repair of Federal facilities, flood control, and disaster assistance.

There appears to be a reasonable basis for concluding that the "Early Public Notice" and "Notice of Findings and Public Explanation" for many small projects are not cost-effective and do not significantly enhance the effectiveness of the Executive Order. These requirements should be eliminated and dependence placed on the NEPA process to protect the public

involvement since many actions that can be subject to flood losses or adversely impact on the floodplain fall below NEPA thresholds. A more appropriate means by which to reduce the burden placed on agencies by the two public notice requirements would be to establish thresholds or categorical exclusions that exempt small or routine actions from specific steps in the review process as discussed in previous sections. Another alternative, currently used by some agencies, would be to issue cumulative or group notices when a number of related small actions are to be taken in an area over a short period of time.

Areawide Compliance

The Department of Housing and Urban Development has proposed permitting a one-time communitywide review for compliance with the Executive Order in communities that have large portions of their existing development in the floodplain. The advantages of the areawide approach are to:

- (1) facilitate the comprehensive assessment including cumulative impacts, which normally are not being done under individual unrelated project assessments in the general vicinity;
- (2) increase the size of the territory to be reviewed, thereby making available more flood-free locations that can meet "the practicable alternatives test" of the Order; and
- (3) reduce unnecessary paperwork and redundant public notices.

This areawide compliance procedure has been used by HUD to comply with NEPA in several instances. Use of the procedure by HUD for compliance with Executive Order 11988 was an issue between HUD and the consulting agencies during the development of the HUD implementing procedures. The consulting agencies would agree only to a trial of the approach until it could be shown that it could be effectively implemented on a routine basis.

While the consulting agencies conceded that there are advantages to an areawide approach particularly by expanding the range of practicable alternatives, their major concern was that use of the areawide approach could result in a superficial analysis of a broad geographical area without the site-specificity necessary to effectively evaluate actions applied to individual structures. For instance, an areawide review may support a decision to rehabilitate a neighborhood on the basis that there is a critical areawide housing shortage and that most of the structures could be adequately protected from flood damages. Individual structures in that neighborhood, however, could be built at lower elevations and be subject to repeated flooding. To be effective, an areawide compliance procedure would have to be sensitive to these unique attributes of individual structures. One way to do so would be to use the areawide review process to establish groundrules that can be used as a basis for decision-making on individual structures within the project area. This may make it unnecessary to apply all steps of the eight-step process to each structure. The concept of an areawide review need not be eliminated; however, it may not be an adequate substitute for analysis of individual structures and for decision-making on a structure-by-structure basis. A limited trial of the procedure would be advisable prior to widespread implementation.

Practicable Alternatives

One of the two basic requirements of the Executive Order is that prior to conducting, supporting, or allowing an action in the floodplain, a Federal agency must determine that the floodplain is the only practicable location for that action. Section 2(a)(2) states:

If an agency has determined to, or proposes to, conduct, support, or allow an action to be located in a floodplain, the agency shall consider alternatives to avoid adverse effects and incompatible development in the floodplains. If the head of the agency finds that the only practicable alternative consistent with the law and with the policy set forth in this Order requires siting in a floodplain, the agency shall, prior to taking action, (i) design or modify its action in order to minimize potential harm to or within the floodplain, consistent with regulation issued in accord with Section 2(d) of this Order, and (ii) prepare and circulate a notice containing an explanation of why the action is proposed to be located in the floodplain.

The WRC Guidelines define "practicable" as follows:

Practicable - capable of being done within existing constraints. The test of what is practicable depends upon the situation and includes consideration of the pertinent factors, such as environment, cost or technology.

Practicable alternatives can include carrying out the proposed action outside of the floodplain, accomplishing the same objective using other means, or taking no action at all. There can be alternative sites within the floodplain that need to be evaluated if there are no practicable sites outside the floodplain. Finally, the floodplain location itself must be shown to be practicable before the action can be taken, and the importance of the floodplain location must clearly outweigh the requirements of the Order.

A majority of the responses that directly or implicitly addressed one or more provisions of the Executive Order commented on the concept of selecting practicable alternatives to floodplain locations. These comments can be grouped roughly into three major issue categories:

- o port facilities and the concept of functionally dependent uses,
- o areas with physical constraints that severely limit or preclude the availability of nonfloodplain locations.
- o Actions that are alleged to be private actions (i.e., actions that receive no direct Federal assistance) but that are regulated, licensed, insured, or dependent on loan guarantees from Federal agencies.

The Port Industry and Functionally Dependent Uses

Nine of the comments express concern over application of Executive Order 11988 to inland or coastal port facilities. The commentators include associations, port districts, a legal foundation, and several individuals representing a related industry (0-4, 0-5, 0-7, 0-13, 0-17, 0-18, 0-31, 0-33, C-24). In response to earlier concerns expressed by the industry, FEMA contracted with Simon, Li & Associates to address the impacts of both Executive Order 11988 and NFIP minimum floodplain management standards on construction of inland port facilities. As presented in its study report, "Effect of Floodplain Regulation on Inland Port Facilities," published in January 1983, the contractor found that the objectives of Executive Order 11988 and the economic need for the development of inland port facilities were not incompatible. Although few instances of conflict could actually be identified, the study contractor discovered a widespread perception among those involved in the port industry that the Executive Order did hinder port development. In some sectors of the industry it was found that the Executive Order is perceived to prohibit all floodplain development. A number of the comments received in connection with the present review also indicate that this misperception is sufficiently widespread to warrant concern.

This misperception may have been reinforced by staff of some Federal agencies who may also have viewed the Executive Order in this context either due to misinformation or because this interpretation was compatible with their own perception of their agencies' objectives. However, this is clearly neither the intent of the Executive Order nor the accompanying WRC Guidelines. The WRC Guidelines specifically state that their intent is "not to prohibit floodplain development in all cases, but rather to create a consistent government policy against such development under most circumstances." Since docking and loading and unloading facilities must be located on a navigable waterway, it could be assumed that in most cases proper application of the eight-step process contained in the WRC Guidelines to a port facility would lead to the conclusion that there would be no practicable alternative to a floodplain location. However, this is not always true, and alternative locations and actions still need to be examined.

As a solution to this problem of misperception, FEMA's study contractor recommended the explicit recognition of the existence of functionally dependent structures and uses in both Executive Order 11988 and NFIP floodplain management standards. This concept of functionally dependent uses is contained also in nearly all of the comments received during this review that address this issue. The definition of what uses are functionally dependent, however, is not clear. The "port study" as well as all comments received in response to this present review appear to agree that docks, off-loading facilities, and perhaps temporary in-transit storage facilities are functionally dependent on a waterfront location. One comment, however, also includes all river-related industries, structures, and facilities (0-5). A State agency expressed the fear that the concept was viewed by some commercial or industrial interests as including warehousing, distribution, manufacturing, assembling, processing, packaging, and other ancillary activities (3-17).

Furthermore, asserting that a given facility is determined to be functionally dependent, it still must be determined whether that determination is in any application in compliance with Executive Order 11988 and, if so, what

they are. The responses addressing functionally dependent uses range from those who believe this concept would merely lessen the burden of proof in showing that there are no practicable alternative locations to those who view functional dependence as a means of exempting the port industry from Executive Order 11988 provisions as well as NFIP floodplain management elevation and floodway requirements. Thus, although a worthwhile concept in principle, if imprudently applied, the concept of functionally dependent uses could undermine efforts by Federal, State, and local governments to reduce flood damages.

Although the term "functionally dependent use" does not explicitly appear in either the Executive Order itself or WRC Guidelines, both permit floodplain actions if there is no practicable alternative location or action, provided that the floodplain location itself is practicable (i.e., the action can be undertaken in a manner which minimizes flood damages and adverse impacts on the floodplain) and provided that the importance of the floodplain location clearly outweighs the requirements of the Order. The concept of functionally dependent structures can be viewed as an extension of this provision in the Executive Order that permits actions in the floodplain if no practicable alternative exists. Functionally dependent uses were discussed during the drafting of the WRC Guidelines and have been incorporated into the FEMA implementing procedures. FEMA defines a functionally dependent use as "a use which cannot perform its intended purpose unless it is located or carried out in close proximity to water (e.g., bridges and piers)." The only time the term is used in FEMA regulations is as an exemption to a prohibition on providing assistance for new construction and substantial improvements in floodways and new construction in coastal high-hazard areas. Functionally dependent uses are not exempted from the need to examine practicable alternatives or any other provisions of the FEMA regulations pursuant to Executive Order 11988.

Since there are uses that are functionally dependent on a waterfront location, which usually is designated as a floodplain, at the time the Executive Order or the WRC Guidelines were drafted it may have been advantageous if a concept such as functionally dependent had been used as a means of indicating that there were uses for which there would often be no practicable alternative to a floodplain location. However, the fact that such a concept was not incorporated into the Executive Order does not hinder its application. Functionally dependent uses such as port facilities and similar uses can be accommodated through use of the eight-step planning process outlined in the WRC Guidelines. The proper application of this procedure should result in a decision that recognizes the need to provide a number of port facilities under many circumstances.

One the other hand, the fact that a particular use is functionally dependent is not sufficient reason for exempting that use from the Executive Order's provisions or hazard mitigation measures per se. Even though in many cases review of a functionally dependent use can be expected to result in a decision to locate in the floodplain, there is still need to evaluate practicable alternatives and mitigation measures. At a minimum any review should consider the following:

- o There may be alternative waterfront locations that are not floodplain.

- o There can be a variety of possible floodplain locations subject to different degrees of hazard. Some sites may allow the location of part or all of the facility out of the floodplain.
- o There can be a variety of designs for a facility that could lessen or increase hazards or impacts on the floodplain.
- o There are floodplain locations where the hazards or adverse impacts are so great that not even a functionally dependent use is practicable.
- o There is a need to differentiate among various types of port-related uses.

The term functionally dependent use has value in that it represents a recognition that there are uses that by definition generally must exist within the floodplain, and that use of the term can help prevent an overly restrictive interpretation of the Executive Order by Federal agencies. However, at this point there is no compelling need to modify the Executive Order or the WRC Guidelines to explicitly address these functionally dependent uses. Instead, interpretation should be provided to acknowledge that functionally dependent uses exist and that in these few cases proper application of the Executive Order probably will result in the selection of some floodplain location. This guidance should limit functionally dependent uses to those uses that clearly require a waterfront location, not to include ancillary facilities that could be separated from the on- or off-loading facilities themselves. It also should indicate that the fact that a use is functionally dependent would not eliminate the need to evaluate practicable alternatives or utilize hazard mitigation measures as practicable.

Application of Practicable Alternative to Private Actions

The application of the Executive Order to actions that are primarily Federal actions is relatively straightforward. These actions include actions taken by a Federal agency on government land and actions that are wholly or primarily financed by a Federal agency. Difficulties in application of the Executive Order appear to increase as the degree of Federal involvement in a project declines. For instance, some actions are initiated and financed entirely by the private sector, and Federal agency involvement may be limited to the issuance of a permit, provision of insurance, or guarantee of a loan. Examples of these types of actions include Corps of Engineers Section 404 permits, EPA regulation of hook-ups to existing EPA-financed sewerage systems, and FHA mortgage insurance or VA mortgage guarantees. Although direct Federal assistance may not be involved or may be minimal, action by a Federal agency to deny a permit or approve a project for mortgage insurance or a hook-up to an existing sewerage system may have the effect of making that development infeasible.

Application of the Executive Order to these types of actions may result in the selection of a practicable alternative that is practicable for the Federal agency but not practicable or desirable for the private sector applicant. For instance, the Federal agency may determine that there is no housing shortage in a community and that there are practicable locations for subdivisions outside of the floodplain and deny a permit or disapprove an application. These alternatives may be available to the private sector as a whole, but not to the applicant, who may only own floodplain property. Owners of the

nonfloodplain property may be unable or unwilling to provide the housing or other services demanded by the community. The issue raised is one of how restrictively should the concept of practicable alternatives be applied to actions that can be regarded as primarily private in nature.

The comments that addressed this general issue ranged from the advocacy of strict application of the concept of avoidance of floodplains to all actions, no matter how minor the Federal involvement, to advocacy of application only in situations of high risk to life and property when no direct Federal financial assistance was involved. Several comments addressed instances in which the Corps of Engineers is said to have issued Section 404 permits to property owners when there were other practicable alternatives that were either not evaluated or selected (F-10, F-26, S-17). One comment alleges that in one instance a permit was granted for stream channelization on the grounds that it was the only practicable alternative under the Corps' regulatory jurisdiction (F-10).

A number of comments originating from what can be characterized as land developers and related interests focused on the definitions of "unwise development" and "adverse impacts" as a means to clarify the application of practicable alternatives to these private developments (0-1, 0-8, 0-24, 0-25). Generally, these comments argue that, because these terms are not precisely defined, the individual Federal agencies have too much discretion, resulting in interpretations of the Executive Order that are inconsistent and often are too broad in regard to its application to land development. Two of the comments focus on the President's statement accompanying the Executive Order, in which he said that "... unwise use and development of our riverine, coastal, and other floodplains not only destroy many of the special qualities of these areas but pose a severe threat to human life, health, and property" (0-8, 0-25). The thrust of the comments is that "unwise" actions should only include those actions which destroy special qualities of unique floodplains or pose severe threats to life, health or property. By defining "unwise" actions as well as "adverse impacts," these responders believe that the Executive Order itself could be limited so that it would not be used by Federal agencies solely for the preservation of natural floodplains regardless of the quality or benefits derived from the proposed project. Two comments included the recommendation that interpretations of "unwise" use or "adverse impacts" be developed after public comment (0-1, 0-25).

It should be emphasized that private financing does not necessarily mean that a project does not include costs to or have an impact on the Federal Government and the public at large. One such cost to both the Federal Government and the general taxpayers would be damages to adjacent properties insured by a Federal agency or eligible for some form of disaster assistance. Improperly designed or constructed floodplain development can increase upstream flood elevations, downstream peak flood discharges, or the velocity of floodwaters. Provisions of State and Federal tax codes also can have the effect of transferring at least some additional cost of flood damages to the taxpayers in general. In addition, it should be emphasized that the objective in the Executive Order to preserve or restore natural or beneficial floodplain values does not apply solely to wildlife habitat, aesthetics, or recreation. Natural and beneficial values also include the floodplains capability to convey and store floodwaters, recharge groundwater, and preserve water quality. These values can have a direct and significant impact on public

health and safety, property damages, and the economic well-being of a community.

The Executive Order and the WRC Guidelines, agreed to by member agencies, require that a Federal agency examine all practicable alternatives even in cases where Federal involvement is somewhat limited. Practicable alternatives must be examined in the context of what is practicable to both the Federal agency and the applicant. The impacts of each of the alternatives must be balanced against the utility and advantages and disadvantages of choosing that alternative. It would not be practicable, for instance, for an agency to deny a permit or disapprove a project if locations outside of the floodplain are demonstrably inferior, outside of the control of the applicant, the project can be adequately protected against flood damages, and the adverse impacts on the floodplain are minor or can be minimized. On the other hand, it would not be practicable to grant a permit for an action that adversely impacted on the floodplain or posed a threat to lives or property in the community solely to reduce construction costs or benefit one property owner or interest. Clearly, permits and approvals also should not be granted if the applicants themselves have alternative ways to develop their property that avoid adverse impacts on the floodplain and are practicable. There appear, however, to be no clear cutoffs that can be established for this balancing process governmentwide because of the almost infinite variety of actions and circumstances that are encountered. It should be recognized that a balancing will have to be undertaken by Federal agencies when applying the Executive Order to actions that are privately financed and that the decisions arrived at are likely to be regarded as unsatisfactory by at least some interested parties.

There is enough latitude in the Executive Order and the WRC Guidelines to balance the degree of Federal involvement with the severity of adverse impacts associated with a proposed project. This approach appears to be commonly practiced by most Federal agencies as they apply the Executive Order to privately funded actions. No doubt inconsistencies will exist among the various agencies and within each individual agency as a result of this case-by-case balancing, and no doubt some interested parties will consider some actions to be overzealous or in violation of the intent of the Executive Order. There appears to be no reasonable alternative to this exercise of discretion by individual agencies in their application of the Executive Order to the myriad of programs and circumstances.

Practicable Alternatives and Locational Constraints

Two comments addressed application of the Executive Order concept of practicable alternatives to locations where sites outside of the floodplain are generally not available (O-17, S-11). The locations cited include Louisiana with its extensive floodplains in the Mississippi delta and its coastal marshes and Appalachia, where steep mountain slopes force development into the floodplain. The Executive Order clearly allows for locating actions in the floodplain if there are no practicable alternative locations, provided that the impacts of the action can be minimized and provided that the importance of the action clearly outweighs other Executive Order requirements. However, the Federal agency still must examine alternative floodplain sites which may be less hazardous or have fewer or less severe impacts as well as alternative ways to conduct the activity. An area subject to shallow, low-velocity flooding, for instance, would be preferred over an area which was subject to deep flooding and high velocities, or which contained wetlands.

Another comment noted similar problems in applying the Executive Order to projects located in or adjacent to densely developed, central business districts (L-28). This comment recommended support of a finding of no practicable alternative in respect to the Community Development Block Grant programs if the proposal is consistent with local land use or urban development plans. FEMA cannot concur with this recommendation although it is recognized that in highly urbanized areas some use will usually be made of vacant floodplain lands. A well-planned project involving some degree of Federal assistance may have significantly fewer adverse impacts than the strictly private development that might otherwise occur. However, these types of concerns can be adequately addressed under existing provisions of the Executive Order and the WRC Guidelines.

Executive Order 11988 and the National Flood Insurance Program (NFIP)

A number of comments were received regarding the relationship between the Executive Order and the National Flood Insurance Program (NFIP), which is administered by FEMA. Several of these comments are critical of NFIP regulations or policies that are alleged to be inconsistent with Executive Order provisions. Other comments raise issues concerning flood hazard mapping or flood-proofing standards in regard to the Executive Order, when such issues are actually governed by NFIP policies or regulations. The Executive Order merely references NFIP standards as the minimum flood hazard mitigation standards to be used by Federal agencies, when taking actions in designated flood hazard areas.

The NFIP and Avoidance

The most important of the issues raised are that the NFIP policies and regulations do not require avoidance of flood hazard areas if practicable alternatives are available and that its regulations are not designed to protect natural and beneficial floodplain values. These issues were posed by HUD as follows in its comments:

FEMA should eliminate the disparity in criteria between the present Executive Order and that of the NFIP relating to the following: (i) avoidance of development in the designated special flood hazard zone; and (ii) protection of the natural and beneficial values of the floodplains. NFIP program regulations were never amended to comply with the present Executive Order criteria relating to floodplain avoidance and protection of the natural values of the floodplains.

The HUD comment then focused on the issuance of Letters of Map Amendment (LOMAs) by FEMA. This issue is discussed more fully later in this section.

The attachments to the HUD comments, originally submitted to the President's Commission on Housing on January 8, 1982, also call for a change in national policy toward floodplains and a resolution to the disparity in criteria regarding avoidance and natural and beneficial floodplain values. The thrust of many of the suggestions in the attachments is to utilize NFIP minimum requirements to evaluate most types of actions involving single-family housing rather than fully apply the Executive Order. The State of Mississippi made a similar observation regarding the disparity between the NFIP and the

Executive Order. Their view, however, appears to advocate modification of the NFIP so that it better protects natural floodplain values.

Community participation in the NFIP is voluntary. The Federal Government makes affordable flood insurance available in those communities that agree to manage future floodplain development. Communities are required to adopt and enforce floodplain regulations, usually in the form of zoning ordinances or building codes, that meet or exceed minimum NFIP standards. Because the quid pro quo for adoption of these floodplain management regulations has been flood insurance coverage on structures, the NFIP criteria have been primarily oriented toward preventing property damage. Other provisions of the regulations such as those regarding floodways or the alteration of watercourses are again directed toward regulating actions which could increase flooding and, as a result, increase losses in property damage and increases in insurance claims and other Federal expenditures.

We agree that the NFIP minimum floodplain management criteria do not specifically require avoidance of floodplains and that program performance standards are aimed at protecting property rather than natural and beneficial floodplain values. However, the overall thrust and effect of the NFIP is consistent with achieving the objectives of Executive Order 11988. The NFIP is a unique Federal program that operates solely in the floodplain and, given its structure, could not achieve its objectives of preventing flood damages and reducing Federal expenditures for disaster assistance and flood control if it were to demand avoidance by the community and property owners to the degree practicable.

Prior sections of this review discussed the application of the Executive Order concepts of avoidance of the floodplain and selection of practicable alternatives to actions that are initiated and financed primarily by the private sector, but that have limited Federal involvement. The conclusion was that, for these actions, the Executive Order permitted a balancing of the degree of Federal involvement with the severity of the action's impact on the floodplain. The NFIP can be characterized as a program in which Federal involvement in individual floodplain actions is not substantial. The NFIP provides flood insurance coverage on structures located in participating communities. For new construction in most communities this coverage is provided at actuarial rates which reflect the risks to which the structure is exposed. Net Federal expenditures are intended to eventually cover only the administrative costs of the program. Some structures regulated by ordinances adopted to comply with NFIP criteria do not obtain flood insurance coverage and many others do not receive any other form of Federal assistance. Since Federal involvement in most of these actions is minimal, NFIP criteria are oriented towards regulating those aspects of floodplain development where there is the most direct Federal interest such as minimizing losses to property and, by doing so, reducing Federal expenditures for flood control and disaster assistance. In addition, the WRC Guidelines state that the Executive Order is not intended to prohibit development, but rather to create a consistent Federal policy against such development under most circumstances. Requiring the inclusion in local NFIP ordinances of provisions prohibiting floodplain development would be inconsistent with this interpretation. The locational decisions required to implement a lesser standard are more properly made at the State or local level provided that the overriding Federal interests are adequately protected.

In order for the NFIP to operate effectively and achieve the program's dual objectives of minimizing future flood losses and reducing Federal expenditures for disaster assistance and flood control to be achieved, participation by communities in flood-prone areas and purchase of flood insurance by individuals must be the norm. The Flood Disaster Protection Act of 1973 increased NFIP participation by prohibiting Federal agencies from providing financial assistance for construction or acquisition of structures located in special flood-hazard areas of nonparticipating communities. In participating communities, receipt of direct or indirect Federal assistance for this construction or acquisition was made contingent on the purchase of flood insurance coverage. The combination of the benefits of affordable insurance and the sanctions regarding Federal assistance proved highly effective in achieving the goal of widespread participation by communities despite the requirement to adopt and enforce what some communities regarded as rather stringent floodplain management standards. The NFIP can continue to progress toward achieving its objectives only as long as communities and individuals perceive that the benefits of participation exceed its costs.

It would no doubt be possible to revise NFIP regulations to require communities to adopt and enforce ordinances that prohibit floodplain development if there were practicable alternatives that would protect natural and beneficial floodplain values. However, local ordinances must regulate all floodplain development, not just that which receives Federal assistance. As a result, an overly restrictive requirement for avoidance of floodplain actions could have the effect of prohibiting all floodplain development and be construed as an unconstitutional "taking" of property without compensation. Floodplain regulations have been and must continue to be drafted so that they can withstand legal challenges. Assuming that an avoidance ordinance was viewed as a valid exercise of police powers, which reside in State and local governments, many communities could be expected to continue to participate in the NFIP. These communities would most likely be those with large amounts of existing development that required continued Federal assistance and flood insurance coverage. Floodplain management regulations, however, are most needed and have the greatest effect in communities that have undeveloped floodplains, where there are still opportunities to shape future development. Strict application of an avoidance requirement would leave these communities with little to gain from participation in the NFIP and have the effect of driving many out of the program. Loss of these communities could cripple efforts to reduce flood losses and minimize Federal expenditures for disaster assistance and flood control. NFIP floodplain management criteria must be carefully designed to be strict enough to minimize future flood damages but not so strict that the benefits of participation pale in comparison.

Although the NFIP does not specifically require avoidance of floodplains or selection of practicable alternatives, it should be emphasized that the program has often had that effect. In most riverine areas, for instance, floodplains are relatively narrow and there are a variety of possible locations for housing. NFIP floodplain management criteria require that communities prohibit any development in the floodway that would cause any increase in flood elevations upstream. This standard generally results in no additional floodway development. In the floodway fringe area (special flood hazard zone), the added cost of construction and the annual flood insurance premium clearly indicate the increased and increased costs of practicing floodplain management and provide information to communities and individuals so that they can make informed decisions regarding location and

construction of structures. Using the NFIP flood hazard maps, individuals and communities, as well as Federal agencies, can identify alternative locations for actions that are often easier and less expensive to develop. In addition, local officials tend to steer development away from floodplain areas and in some instances adopt more restrictive regulations to discourage this development even more. This steering unfortunately does not occur in as great a degree in highly urbanized areas with extensive floodplains where developable land is at a premium or in many coastal areas where property close to the ocean is highly desirable. In these areas, the NFIP has probably not resulted in avoidance or preservation of natural and beneficial floodplain values, despite increased construction costs. These areas probably will be developed, however, no matter what posture is taken by the NFIP.

One of the primary reasons for issuance of Executive Order 11988 was to ensure that Federal agencies, at a minimum, complied with NFIP floodplain management standards. Federal agencies have often held themselves aloof from local land use regulations. When an agency complied with local zoning ordinances or building codes, it was generally because in that instance it was in the Agency's interest to do so. Despite the issuance of Executive Order 11296 in 1966, many Federal agencies continued to take actions in the floodplain that were clearly inconsistent with the floodplain management practices the Federal Government was requiring of local units of government. Executive Order 11988 added requirements that ensure that Federal agencies do not take actions that undermine the Federal Government's efforts to reduce flood losses through sound floodplain management. However, Executive Order 11988 not only requires that Federal agencies apply to themselves the same standards it applies to communities and individuals through the NFIP, but also requires that they provide leadership and set an example by holding themselves to higher standards such as avoidance and selection of practicable alternatives in actions over which they had direct control.

Most Federal actions provide for a great deal of discretion. Federal agencies can generally choose where they provide assistance within general overall constraints. The Executive Order requires them to exercise their discretion in a manner which minimizes adverse impacts on floodplains. When viewed in this context, it is not inconsistent that the Federal Government should hold itself to higher standards than it demands of the private sector through the NFIP.

Alternative Forms of Flood Protection

A number of the comments cite the need to apply different construction standards to industrial construction than those developed for residences (1-24, 0-13, 0-17). The comments that address this issue generally originate from the port industry. Although this concern was brought up in conjunction with Executive Order 11988, the issue is a broader one. The Executive Order references NFIP floodplain management criteria as minimum requirements for minimizing flood damages except where demonstratively inappropriate. The standards for special flood hazard areas already make a distinction between new or substantially improved residential construction, which must be elevated so the lowest flood is at or above the base flood elevation, and new or substantially improved commercial and industrial structures, which can be either elevated or floodproofed. At present, nonresidential structures that are floodproofed must be floodproofed so that the structure is watertight,

with walls that are substantially impermeable to the passage of water (i.e., dry floodproofed).

The thrust of the comments is that "wet-floodproofing" should be permitted as well. Wet-floodproofing is essentially designing a structure so that it can be flooded without damage. In theory, the building could be hosed down, portable equipment reinstalled, and the building back in full operation soon after floodwaters recede. This issue is of greatest importance in those areas where port facilities must be designed to accommodate extreme fluctuations in water surface elevation. The study on the "Effect of Floodplain Regulations on Inland Port Facilities" conducted for FEMA also led to the recommendation that the wet-floodproofing of port facilities be an alternative permitted by NFIP floodplain management regulations. In order to wet-floodproof a structure under regulations now in effect, a variance for that property would have to be obtained from the local unit of government.

FEMA has issued an advance notice of proposed rulemaking that requests comments on how to improve NFIP floodplain management criteria. The issue of wet-floodproofing will be considered as part of this ongoing review. Although wet-floodproofing is feasible for a number of types of structures, it can be highly inappropriate for most others. Any rule change would have to place strict limitations on the circumstances under which it could be utilized.

Use of the 50-Year Standard for Residential Basements

The minimum floodplain management criteria of the NFIP require that the lowest floor, including basement, of residential structures be elevated to or above the base or 100-year flood level (44 CFR 60.3 (c) (2)). Construction of residential basements in the floodplain is permitted only in those communities that apply for and are granted an exception to this participation requirement. Generally the exceptions that have been granted require that the lowest opening of the basement be at least one foot above the base flood elevation. To date, only about 40 communities have applied to FEMA for exceptions to permit residential basements, although additional communities have been granting individual variances to permit their construction on a particular property.

HUD Minimum Property Standards (MPS) are used by FHA, VA and FMHA for their housing programs. HUD MPS criteria require only that the first habitable floor of a residence be elevated above the 100-year flood level. Basements are permitted provided that the lowest opening is at or above the 50-year flood elevation and provided that at time of construction, they are not designed for use for living, sleeping, eating, cooking, or combinations thereof. HUD's justification for use of the 50-year standard for basements in MPS has been that an unfinished basement could be flooded with only minimal damages.

Since communities participating in the NFIP must adopt and enforce regulations that meet or exceed minimum NFIP criteria, a residence built using the 50-year basement standard in HUD MPS would violate local ordinances and jeopardize a community's NFIP eligibility. This conflict between NFIP floodplain management regulations and HUD MPS has been a point of controversy since the early days of the NFIP. Since communities must adopt and enforce regulations that meet or exceed NFIP minimum standards to maintain eligibility, the more restrictive NFIP standard in the event it is now being

enforced. The issue was again raised in the context of the consultation between HUD and the consulting agencies during the development of the various drafts of HUD's Executive Order implementing procedures. The attachments to HUD's comments on this review also raise the issue. The HUD preference is for a single, recognized national standard.

The NFIP floodplain management standards regarding basements that are now in effect are consistent with Executive Order 11988 objectives to reduce the risk of flood losses and minimize the impacts of floods on human safety, health, and welfare. HUD MPS standards assume that basements will remain nonhabitable. NFIP regulations, however, assume that at some point a large percentage of these basements will be finished and converted to habitable uses, significantly increasing their hazard potential. Overtopping or structural failure of a floodproofed basement results in immediate inundation and will likely result in a virtual total loss of all finished surfaces, equipment, and contents. Failure of load-bearing basement walls could result in major structural damage to the residence as a whole. In contrast, the overtopping or failure of a structure built without a basement, but properly elevated, generally will result in only minor damages.

The substantially higher losses due to the catastrophic nature of the flood losses that could occur due to basements are reflected in the high flood insurance rates that are now in effect. For basements built to the 50-year standard, these rates would not be affordable, particularly for the low and moderate income families that are the target for FHA loan programs. Since these families are required to purchase and maintain flood insurance coverage as a condition of receiving FHA loans, use of a 50-year basement standard would not be feasible even if permitted by NFIP floodplain management criteria. In addition, providing this low level of protection in areas subject to flash flooding could threaten the lives and safety of residents if basements were converted to habitable uses. The increased protection provided by use of the NFIP's 100-year standard can generally be provided at minimal cost since the difference in elevation between the 50-year and 100-year floods is generally a few feet or less.

There has not been a great deal of interest concerning the construction of floodproofed basements by either communities or individuals. During recent years only about 40 requests have been received for basement exceptions and about 30 have been granted. Overall less than one percent of the insured structures built in communities that have flood elevations have been built with basements permitted through a community exception to NFIP regulations or individual property variances granted by the community. This low number is due in part to the technical difficulties and high cost of building an adequately floodproofed basement. It is also in part due to the fact that most floodplain development is now being built in areas where a slab-on-grade or pile and column construction is the norm.

There are few indications that NFIP standards concerning basements are causing a hindrance for either communities or individuals. Use of the 50-year standard for floodproofed basements as used in HUD minimum property standards is not feasible or appropriate in most communities and the increase that would result. However, the NFIP exception procedures for areas with basements evaluated as part of the community review process conducted by NFIP floodplain management officials.

Substantial Improvement

NFIP floodplain management criteria define substantial improvement to be "any repair, reconstruction, or improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure either (a) before the improvement or repair is started, or (b) if the structure has been damaged, and is being restored, before the damage occurred." The NFIP regulations further define substantial improvement as follows:

For the purposes of this definition "substantial improvement" is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not the alteration effects the external dimensions of the structure. The term does not, however, include either (1) any project for improvement of a structure to comply with existing State or local health, sanitary, or safety code specifications which are solely necessary to assure safe living conditions or (2) any alteration of a structure listed on the National Register of Historic Places (44 CFR 59.1) or a State Inventory of Historic Places.

The definition of substantial improvement was discussed by the Senate Committee on Banking, Housing, and Urban Affairs during the markup of the Flood Disaster Protection Act of 1973. The Committee Report specifically endorses the language contained in the basic NFIP definition given in the first sentence of the preceding paragraph. Substantial improvements to floodplain structures must comply with the same standards as new construction. The "50 percent of market value prior to the improvement" concept is commonly used in local zoning ordinances and building codes and, thus, does not represent a departure from standard practice.

The attachment to the HUD comments questions whether HUD can apply a less-restrictive standard to some of its programs. The HUD view was expressed as follows:

There should be a uniform standard and definition for substantial improvement conducted in flood hazard areas and wetlands. To support the national goal to provide decent, safe, and sanitary housing through the rehabilitation of existing structures and through the conversion of nonresidential buildings to housing, the Department encourages the removal and/or the relaxation of regulatory constraints in established viable residential neighborhoods.

One version of the proposed HUD implementing procedures, for instance, defined rehabilitation of housing as 50 percent of the replacement cost after the improvement or repair is completed. This, in effect, would permit HUD's rehabilitation programs to double the value of a structure without fully complying with NFIP floodplain management criteria as required by Executive Order 11988. Structures rehabilitated in accordance with that HUD standard

would violate local ordinances which use the existing NFIP definition. Thus, HUD would be placed in the position of having standards for its housing rehabilitation programs that conflict with local zoning ordinances and the Executive Order 11988 mandate to comply with NFIP minimums.

Rehabilitation of existing structures to provide decent housing is a cost-effective way of meeting a basic need and should be supported. However, unless modified to reduce future flood damages, rehabilitation of existing structures that are subject to recurrent flooding is not cost-effective and does not meet the objectives of providing decent, safe, and sanitary housing or the objectives of the Executive Order unless that housing can be modified to reduce flood damages. Any NFIP definition has to apply to all floodplain structures, not just those being rehabilitated using HUD financial assistance. Applied nationwide, a less-restrictive definition could significantly increase flood losses over time. It should be noted that the NFIP definition does not include any improvement to a structure undertaken to comply with existing State or local health, sanitary, or safety code specifications necessary to ensure safe living conditions. This exclusion combined with the exclusion of improvements less than 50 percent of fair market value prior to the improvement should allow sufficient opportunities for the rehabilitation of many structures without compromising the objectives of the Executive Order or the basic goals or insurance mechanisms of the NFIP.

Identification of the Flood Hazard

Section 2 (a) (1) of the Executive Order requires that Federal agencies determine whether proposed actions would take place in a floodplain. Agencies are to use FEMA flood maps developed as part of the National Flood Insurance Program or more detailed data, if available, as the basis for making this determination. If NFIP maps have not been produced for an area, the agency is to use the best information available. The WRC Guidelines also recommend the use of other Federal agencies to develop flood data, or failing that, qualified consulting engineers.

Five comments identified issues related to the identification of flood hazards. Most deal with the deficiencies in available data. For example,

- o A special district suggested that FEMA increase its efforts to complete detailed flood studies for all areas of the country (L-19).
- o The State of Alaska indicated problems in making the determination in remote areas of the State that were not mapped.
- o Another State cited difficulties in areas for which the flood maps were inaccurate and for which detailed studies were not conducted. Federal agencies were said to be reluctant to employ means beyond the use of available flood maps (S-9).
- o One State commented on the failure of Federal agencies to account for stormwater flooding since it is generally not delineated on NFIP maps (S-17).
- o One State expressed problems with the FEMA practice of not mapping Federal lands (S-28).

Flood maps are developed primarily to meet the specific needs of the National Flood Insurance Program which include local floodplain management and determining who must purchase insurance and at what rate. Early in the program it was recognized that it was not cost-effective to do detailed engineering studies for all communities and all floodplains. Therefore, the studies were limited to areas with existing development or areas that were likely to develop within a reasonable time-frame. In addition, a conscious decision was made not to study areas that flooded due to stormwater backup resulting from inadequate storm sewer systems. As of the date of this review, a high percentage of the developed or developing floodplain areas had been studied. Over \$600 million has been expended for flood studies that are completed or underway covering communities with 96 percent of the nation's flood insurance coverage. There are still communities where detailed engineering studies would be cost-effective. Efforts are underway to identify these communities as well as develop inexpensive ways of delineating floodplains in those communities where full studies cannot be justified. However, there will not be sufficient economic justification or funds available to study several thousands of the remaining communities, hundreds of thousands of miles of streams in rural areas, or the storm sewer system of each town or city. Federal agencies who propose actions where floodplains have not been identified or flood elevations not determined will have to continue to use best available data or seek assistance from knowledgeable agencies, States or engineering consultants.

Federal lands were originally not mapped because they were closed to private development, could not be regulated by local governments, and were not eligible for flood insurance coverage. FEMA is now including these lands on NFIP flood maps in those instances where flood data is being developed for the surrounding community. FEMA would not map extensive areas of Federal lands where new data had to be generated. Actions on these lands that would require application of the Executive Order are generally rare enough that a case-by-case analysis of each action is the most cost-effective approach for measuring the flood hazard.

Letters of Map Amendment

NFIP floodplain management regulations provide for the issuance by FEMA of Letters of Map Amendment (LOMAs) which remove structures from the 100-year floodplain in those instances where property was incorrectly designated as floodplain or where corrective actions have been taken that eliminate the risk of the structure being flooded by a 100-year flood. The most common corrective measures that are taken include stream channelization which lowers flood elevations, protective levees, and use of fill to raise structures or entire subdivisions above the 100-year flood elevation. The rationale behind LOMAs has been that the NFIP is intended to apply only to areas subject to flooding by the 100-year or base flood. The advantage to the developer is that structures are no longer considered in the floodplain and the purchase of flood insurance is no longer required under the Flood Disaster Protection Act of 1973. Properties become easier to sell since the uncertainties regarding flooding have been removed.

It has been FEMA's practice to issue conditional LOMAs prior to actual construction when the developer submits plans that include measures that would remove properties from the 100-year floodplain. The LOMA itself is granted only after the flood control measures have been completed as proposed and the

structures have been built. The rationale for granting these conditional LOMAs prior to construction has been that the developer could comply with NFIP criteria and apply for and obtain a LOMA after construction. By becoming involved at an early stage, FEMA can avoid confusion or misunderstandings by ensuring that the design meets minimum standards. This avoids instances where a developer completes a project and applies for a LOMA only to be rejected because he or she failed to fully comply with NFIP standards.

A number of criticisms have been made of the LOMA process that are relevant to this review. One comment indicated that conditional LOMAs implied an endorsement of a project by FEMA and, as a result, undercut local government decision-making (L-7). Developers are reputed to have used conditional LOMAs to pressure local units of government into approving projects despite local apprehension over the project itself. Although letters that FEMA uses to issue conditional LOMAs contain specific language indicating that they are not intended to be used to undermine local decision-making, these situations can occur.

This issue has been similarly raised in connection with the application of Executive Order 11988 by Federal agencies, particularly HUD's Federal Housing Administration (FHA), to subdivisions (F-21). Developers have reputedly applied to FHA for approval of subdivisions for FHA mortgage insurance and been rejected on the grounds that the subdivision was in the floodplain and there were alternative locations for housing in the community. The developer then applied for and obtained a conditional LOMA from FEMA and reapplied to FHA, which approved the subdivision since it would no longer be in the 100-year flood area designated by FEMA. FEMA agrees that the issuance of a conditional LOMA can place additional pressure on other agencies to approve subdivisions based on a so-called FEMA endorsement. Issuance of a conditional LOMA should not, however, remove the property from consideration under Executive Order 11988. The LOMA itself is not issued until after the project is completed as proposed. In addition, Federal agencies are not limited by the Executive Order to NFIP maps for determining if a property is in the floodplain. Use of the maps is only intended as a minimum and use of additional data is encouraged. In addition, the granting of a LOMA is constrained by NFIP enabling legislation that emphasizes reduction of property damage.

A third criticism of the LOMA process is that it violates the intent of the Executive Order because it has tended to encourage the modification of the floodplain through stream channelization, levees, and use of fill (S-17). A developer can be expected to choose one of these methods of flood protection over elevation on pilings or columns or elevated foundations walls since the flood control measure allows the structure or structures to be removed from the floodplain. While these measures may result in increased adverse impacts on natural and beneficial floodplain values, in most cases they increase the safety of floodplain residents and reduce damages to structures. The LOMA process may have this unintended result of encouraging use of fill, stream channelization or other modifications to the floodplain. On balance, however, the program's objectives of protecting property from flood damages results in an emphasis on methods of protection that minimize risk of these damages even if this on occasion adversely impacts on natural and beneficial floodplain values.

Other Issues

Critical Actions

A critical action is defined by the WRC Guidelines to include any activity for which even a slight chance of flooding is too great. The term is not used in the Executive Order itself. The concept of critical action evolved during the drafting of the WRC Guidelines and reflects a concern that the impacts of flood on human safety, health, and welfare for many activities could not be minimized unless a higher degree of protection than the base flood was provided. The WRC Guidelines expand on the concept of critical action by posing the following questions:

If flooded, would the proposed action create an added dimension to the disaster as could be the case for liquefied natural gas terminals and facilities producing and storing highly volatile, toxic, or water-reactive materials?

Given the flood warning lead-time available, would the occupants of buildings such as hospitals, schools, and nursing homes be insufficiently mobile to avoid loss of life and injury?

Would essential and irreplaceable records, utilities, and/or emergency services be lost or become inoperative if flooded?

The basic standard used to evaluate critical actions is the 500-year or 0.2 percent chance flood. This flood is a rare event, and as a standard it provides a high level of protection. The 500-year flood was selected in part because the necessary data were being developed in flood studies for the National Flood Insurance Program and were readily available. The concept that there are critical actions that require additional levels of protection was not questioned in the responses concerning the application of the Executive Order. Issues were raised, however, in regard to the types of actions covered.

The Department of Housing and Urban Development raised two issues in regard to critical action. These issues were discussed during the development of the HUD draft implementing procedures. HUD proposed application of the less-restrictive, 100-year standard to existing nursing homes and housing for the elderly or handicapped while retaining use of the 500-year standard when evaluating new construction. HUD also proposed categorizing elderly housing as a critical action only in those instances in which 50 percent or more of the units were designed for the mobility-impaired. In these discussions, the three consulting agencies (CEQ, WRC, and FEMA) advocated the treatment of both new and existing nursing homes and housing for the handicapped as critical actions as well as all elderly housing if any of the units were designed for the mobility-impaired. Other comments, particularly those from States, generally advocated treatment of elderly housing in general as a critical action (S-14, O-6, G-3, F-14, F-12, G-5, F-15, G-11, S-33, L-17, S-9). Several emphasized the need to provide continuous access to elderly housing during floods.

This review recommends the retention of critical action as conceptualized in the WRC Guidelines and its use for evaluating all proposals for elderly housing of any type. Location of elderly housing in the floodplain is of greatest concern in those instances when short warning times and rapidly rising floodwaters would prevent evacuation of the elderly in a safe and orderly fashion, as well as instances in which suitable shelter is not available for elderly persons who are forced out of their homes. All elderly housing proposals need to be evaluated initially as critical actions. If a location outside of the 500-year floodplain is available and practicable, that location should be selected. If 500-year protection is practicable, it should be provided. Provision of 100-year protection alone should be considered only when existing resources are to be used, all residents are relatively mobile, and it can be shown that there is sufficient warning time to safely evacuate residents to suitable shelters.

The second set of issues raised in regard to critical actions relates to application of the Executive Order to the location of hazardous waste facilities. These facilities are regulated by the Environmental Protection Agency (EPA) under the authorities contained in the Resources Conservation and Recovery Act of 1976. Our files contain proposed regulations to implement RCRA which were published in the Federal Register on December 18, 1978. These proposed regulations included use of the 500-year floodplain as a basis for evaluating solid-waste disposal sites. Use of the 500-year standard was largely consistent with WRC Guidelines, which clearly consider sites that contain or could be used to store hazardous wastes to be critical actions. The final regulation, which was adopted only recently and was brought to the attention of this review initially by Department of the Navy staff and a FEMA Regional Office, contains the following statement regarding site location (Section 264.18(b)):

- (b) Floodplains. (1) A facility located in a 100-year floodplain must be designed, constructed, operated and maintained to prevent washout of any hazardous waste by a 100-year flood unless the owner or operator can demonstrate to the Regional Administrator that procedures are in effect which will cause the waste to be removed safely, before flood waters can reach the facility, to a location where the wastes will not be vulnerable to floodwaters.

These provisions are in direct conflict with the concept of critical action as outlined in the WRC Guidelines and with implementing procedures adopted by other agencies such as the Department of the Navy.

The conflict between the Department of the Navy Executive Order 11988 implementing procedures, which are consistent with WRC Guidelines provisions on critical actions, and the final EPA RCRA regulations was identified during the design of a Navy hazardous waste facility in the Philadelphia area. FEMA was consulted regarding this conflict and regarding the interpretation of the WRC Guidelines. Generally, when two regulations conflict, the more restrictive is applied. In this case, the decision was made to locate the facility in the 500-year floodplain but provide 500-year flood protection. The use of the 100-year standard in the RCRA regulations did make it more difficult to justify the added cost of protecting the site to the 500-year elevation since those regulations were designed specifically to regulate the location of these hazardous waste sites. Of greater concern are instances in which locations

for hazardous waste facilities will be evaluated by EPA alone, without the involvement of any other Federal agency. In these situations the less-restrictive, 100-year standard would be applied by EPA under its procedures.

The storage of hazardous materials or hazardous waste is clearly a critical action and should be treated as such. A 100-year flood event is not an unusual occurrence. During the life of a disposal site protected to the 100-year level, there is a high probability that it will be flooded at least once. This review regards the EPA RCRA regulations as inconsistent with the Executive Order 11988 objectives to minimize threats to life and property. The dangers posed by the disposal of hazardous wastes warrants use of the 500-year floodplain as a basis of evaluation or, if avoidance is not practicable, provision of 500-year protection of the site. In addition, there is no basis for storage of hazardous materials below the elevation of the 100-year flood even if there are plans to move the materials prior to a flood. Flood emergency plans can reduce damages significantly, but they should not be relied on to prevent hazardous wastes from contaminating floodwaters and compounding already serious public health problems. RCRA regulations should be amended to treat hazardous waste disposal sites as critical actions as provided for in WRC Guidelines.

Uniformity Between Agencies

The Department of Housing and Urban Development proposed that:

The Executive Order should mandate uniformity of processing for similar housing programs such as for single family housing administered by the Veterans Administration, Farmers Home Administration, and HUD. Oversight agencies were unable or unwilling to respond to HUD's repeated requests for equitable enforcement, when it appeared that sister agencies were not implementing the Executive Order; however, HUD was under pressure to do so and is doing so.

This lack of uniformity among agencies is of concern for a number of reasons. Most importantly it can make Federal policy toward floodplain development appear inconsistent and can undermine the ability of Federal agencies to provide leadership in managing floodplains. It also can place an agency in the politically uncomfortable situation of refusing to provide financial assistance or approvals on the basis of the Executive Order to an individual or developer who then obtains the needed assistance or approvals from another Federal agency. The agency that denied the assistance or approvals becomes the villain and often must go to great lengths to defend its actions. This inconsistency can occur in the approval of subdivisions for mortgage loan insurance or guarantees. Comments that were received also identified this inconsistency as a problem in the delivery of the various disaster assistance programs (F-15, F-16).

As the comments have indicated, there must be at least a reasonable degree of consistency between agencies in application of the Executive Order to similar programs that apply to similar actions. The Executive Order and the WRC Guidelines recognize that there are differences between Federal programs and that some tailoring of Executive Order provisions will be required. As a result, fixed, uniform standards were not mandated. However, this flexibility was not intended to imply that uniform standards in similar actions were not

desirable. One of the central thrusts of Federal flood policy has been the development of a uniform approach to these problems. The issue of differences in application of the Executive Order to Federal housing and disaster assistance programs, which is part of a larger question of overall consistency among all aspects of these programs, should be addressed within the broader context of Federal policy.

Oversight of Actions Taken by Federal Agencies

Several comments addressed the issue of oversight of Federal agency implementation of the Executive Order. Some of the comments appeared to assume that FEMA had this oversight authority because it was requested to conduct the present review. The concerns expressed are that (1) agencies are not complying with the Executive Order and (2) the Executive Order will be used by some agencies to block private development for the purpose of achieving objectives other than those contained in the Executive Order. The proposed remedy is monitoring of agency actions by FEMA or by some other entity. At this time no Federal agency has this oversight authority over implementation of the Executive Order by other Federal agencies. The Executive Order directs agencies to prepare their procedures "in consultation with the Water Resources Council, the Federal Insurance Administration [now FEMA], and the Council on Environmental Quality." Agencies were also directed to indicate to OMB in their requests for authorizations or appropriations whether floodplain actions were proposed and whether or not they were compliant with the Executive Order. In addition, WRC was assigned the task of periodically evaluating agency procedures and effectiveness. Each agency head, however, was and is responsible for ensuring that his or her agency complies with Executive Order provisions. As the remaining consulting agency actively involved in Executive Order implementation and as the agency responsible for the NFIP, FEMA also should be given a certain degree of deference by other agencies in interpreting Executive Order provisions. However, it would not be appropriate to place FEMA or any other line agency in the position of overseeing the actions of other Federal agencies. Instances of abuse of the Executive Order by Federal agencies can be expected to be reduced as agency field staff become more clearly conversant with Executive Order provisions. More emphasis on the training of field staff in implementing the Executive Order would assist in this effort.

Timing of Application of the Executive Order

Three comments emphasized the need to apply the Executive Order to projects early in the planning process (S-1, F-4, G-3). One suggestion, for instance, was that it might be more appropriate for HUD to conduct the review of housing proposals at the time of program reservation rather than as part of the environmental review. The Executive Order and the WRC Guidelines call for application of the Executive Order to projects early enough in the process to ensure that the initial decisions made are in keeping with the provisions of the Order. Application of the Executive Order after commitments have been made or alternatives eliminated generally results in less avoidance of the floodplain. Neither the Executive Order nor the WRC guidelines establish a specific time at which the review must be carried out because of the many different types of actions covered. This review supports the view that the timing and mechanics of the Executive Order review should be left up to the discretion of individual agencies; however, the agencies should review their procedures and ensure that Executive Order 11988 compliance does in fact

occur early enough in their planning processes to be part of the initial decision-making on agency actions.

Community Development Block Grants

Several comments addressed potential conflicts that could arise as a result of delegation to communities of the responsibility of applying the Executive Order to some Community Development Block Grants (CDBG) (O-6, S-14, F-15). The Executive Order provides for this delegation in those instances in which the community also has assumed responsibility for NEPA compliance. The problem would arise if a community, after application of the Executive Order, used CDBG funds to acquire floodplain property. If the community later were to apply for other Federal assistance needed to develop the acquired floodplain property, it is believed that the agency might feel pressured into providing the assistance since the floodprone property already would have been acquired and no real practicable alternatives would, in fact, exist. One comment suggested that review of CDBG funding be conducted by HUD.

Although this type of conflict could occur, at this time the greater concern and need appears to be that of retaining the parallels with those portions of the NEPA process that also have been delegated to the community. HUD should ensure, however, that communities that are delegated these responsibilities are fully conversant with the provisions of the Executive Order in order to minimize the number of instances in which such conflicts could arise.

Parallels with the Coastal Barrier Resources Act

One response indicated that the Coastal Barrier Resources Act of 1982 would be a good model and suggested similar provisions be applied in all areas subject to flooding (O-19). Other comments indicated parallels between the Coastal Barrier Resources Act and Executive Order 11988 (O-9, O-20, O-23).

The Coastal Barrier Resources Act places strict limits on the expenditures of Federal funds that could encourage development of designated undeveloped coastal barriers on the Atlantic and Gulf Coasts. Federal funds cannot be used for the construction of infrastructure or to assist in the purchase or construction of buildings. Also, Federal flood insurance coverage is denied for new and substantially improved structures.

Although in many instances strict application of Executive Order 11988 might result in a similar decision not to fund, some major differences exist between the Executive order and the Coastal Barrier Resource Act. First, the Executive Order applies to all floodplains, whether partially or fully developed. A strict prohibition on Federal assistance would not be practicable in developed areas since established communities have legitimate needs that must be met. Second, the Executive Order applies to all actions, including issuance of Federal permits or licenses, while the Coastal Barrier Resources Act does not. Third, inland floodplains are more stable and most are not subject to the same extreme hazards as are most of the coastal barriers, particularly those that still remain largely undeveloped. Thus, although the Coastal Barriers Resources Act concept could be applied to selected floodplains if Congress chose to do so, it would be inappropriate to try to apply it to most inland floodplains. The flexibility provided by the Executive Order planning process provides a better mechanism for meeting

floodplain objectives and responding to the needs of both developed or partially developed floodplain communities.

MAJOR FINDINGS

Federal Agency Compliance

It is the consensus of the comments and the finding of this section that although considerable progress has been made by Federal agencies in complying with Executive Order 11988, considerable opportunities for improvement remain and specific corrective actions are needed. Many of the comments cite specific examples in which a Federal agency is alleged not to have applied the Executive Order to an action or actions or has not fully complied with all of its provisions. Some Federal agencies appear to have applied the Executive Order effectively to some programs or in some field offices but not others. Many of the comments note that Federal agency compliance has improved as agency field personnel have become more familiar with the Executive Order and its provisions.

Impact on Floodplain Actions

Application of the Executive Order has resulted in a reduction in the level of Federal support of unwise actions in designated floodplains. The consensus of the comments and the finding of this review is that application of the Executive Order by Federal agencies has resulted in a reduction in the amount of floodplain development as well as a noticeable improvement in the development that has occurred. None of the comments indicate that there has been an increase in the support of unwise actions; however, Federal agencies are still taking actions in floodplains that they should not, and the impacts of some actions are not being minimized as provided for in the Executive Order.

Level of Outside Support

There is strong support for the retention of Executive Order 11988 and for strengthening its implementation by Federal agencies. Although the Federal Register Notice of October 22, 1982, did not explicitly request indications of support or opposition, many comments offered opinions. In general, these comments strongly support retention of the Executive Order and improved implementation of it by Federal agencies. Regardless of opinions on specific provisions of the Executive Order or parts of the WPC Guidelines, the need for a uniform Federal policy toward actions in floodplains is recognized. Governors and State agencies were particularly supportive of retention of the Executive Order and strong Federal implementation. The most commonly cited reasons for this support of the Executive Order were that it prevented Federal agencies from taking actions that conflicted with State water and land use policies and that it reinforces State efforts to discourage unwise development in floodplains. Private sector comments generally supported the Executive Order and, even if not supportive of all provisions, at least recognized the need for a uniform Federal policy regarding floodplain actions.

Compliance by Individual Agencies

Comments on the implementation of Executive Order 11988 by individual agencies identify instances in which agencies have not applied the Executive Order correctly to actions. Comments on implementation of the Executive Order

by individual Federal agencies focus primarily on a few highly visible agencies that take large numbers of actions in the floodplain. Agency implementation appears most effective in those instances in which the agency has complete control over the action or those in which the objectives of the Executive Order are compatible with those of that agency or program. Implementation of the Executive Order appears to be less effective when applied to essentially private actions that are guaranteed or regulated by, or receive limited assistance from, a Federal agency. Federal agencies that were mentioned in the greatest number of comments include the Corps of Engineers, EPA, FEMA, HUD, and DOT. Each of these agencies as well as a number of other agencies was the subject of criticism regarding its implementation of the Executive Order. There is a continued need to improve agency implementation of the Executive Order, to train field staff regarding its provisions, and to obtain greater agency-wide consistency in its application.

Coverage of the Executive Order

The application of the eight-step planning process contained in the Water Resources Council (WRC) Guidelines may not be cost-effective when applied to small, routine actions. The WRC Guidelines, agreed to by the member agencies, outlines an eight-step process for application of the Executive Order to Federal actions. There appears to be general agreement that application of the Executive Order through the eight-step planning process to most Federal actions is highly beneficial and cost-effective. A number of agencies, however, undertake numerous small and routine actions that provide limited opportunities for avoiding the floodplain or reducing damages or impacts and that tend to generate little or no public comment. In these cases, the public notice requirements especially may be burdensome and unproductive. Limited resources would be better utilized if applied to larger actions in which application of the Executive Order could result in avoidance of the floodplain or significant reductions in floodplain impacts. Recommendations for reducing this burden on small, routine actions include more widespread use of thresholds or categorical exclusions to exempt actions from one or more Executive Order provisions; elimination of public notice requirements, depending instead on NEPA; and use of a system of areawide compliance to cumulatively review small actions.

The use of categorical exclusions and thresholds can be an effective means of reducing the burdens of applying the Executive Order to small actions, provided it is done in a manner which does not compromise the Order's objectives. Executive Order 11988 should continue to be applied to all Federal actions that take place in or impact on floodplains. The WRC Guidelines, however, allow for an abbreviated evaluation process if all of the objectives of the decision-making process can be achieved in fewer than eight steps. Thresholds and categorical exclusions can be useful in establishing which actions or levels of actions are appropriate for the use of modified procedures. Thresholds and categorical exclusions should not be used to exempt actions from all Executive Order provisions. At a minimum, agencies should (1) determine whether an action will take place in or have an impact on the floodplain, (2) identify the impacts, and (3) minimize adverse impacts caused by the action. Thresholds and categorical exclusions should be established only after a thorough analysis of agency actions. The threshold established should be set low enough to require full application of the Executive Order planning process to all actions for which there may be practicable alternative locations and should exclude only those actions for

which there are no meaningful opportunities for floodplain management. High thresholds such as the SBA's \$300,000 exemption for loan assistance or categorical exclusions such as the Farmers Home Administration exclusion of repairs to existing facilities are clearly inappropriate and inconsistent with the objectives of the Executive Order.

Based on its review, FEMA does not agree with the view that the public notice requirements of the Executive Order should be eliminated and reliance placed solely on use of the NEPA process to provide public notification and review. There are many floodplain actions that warrant public involvement but would be below NEPA thresholds.

There are advantages to use of an areawide review as a means of applying the Executive Order to many small actions in large floodplains in fully developed communities. While an areawide review will never be an adequate substitute for a site-specific analysis of each structure, areawide reviews can be used to establish criteria by which to make decisions regarding individual structures within the planning area. The procedure should be tested in a limited number of areas prior to widespread implementation.

Practicable Alternatives

The intent of the Executive Order is not to prohibit floodplain development, but rather to establish and consistently apply a Federal policy of avoiding floodplain development whenever practicable. The comments indicate that there is sufficient misunderstanding regarding this point in the private sector and even some Federal agencies to cause concern. This misperception can be corrected by improving the training of the field personnel who must implement the Executive Order with each Federal agency and increasing efforts to heighten awareness of the Executive Order in those portions of the private sector upon which it has an impact.

Sufficient latitude exists under the Executive Order and the WRC Guidelines to allow Federal agencies to balance the degree of Federal involvement with the severity of adverse impacts associated with a proposed project. It is FEMA's opinion that the Executive Order and the WRC Guidelines, agreed to by member agencies, require Federal agencies examine the practicable alternatives for all actions, regardless of whether the Federal Government plays a major or minor role in the proposed activity. However, the practicable alternatives must be examined in the context of what is practicable to both the Federal agency and the applicant. In those instances in which the Federal action in regard to a proposed activity is of a limited nature, the agency must balance the amount of its involvement with the severity of any impacts its action might have. This balancing appears to be commonly practiced by most Federal agencies as they apply the Executive Order in primarily privately funded actions. The characteristics of the floodplain which the Executive Order characterizes as natural and beneficial floodplain values can have a direct correlation to the amount of flood damages and the overall economic well-being of a community. The preservation and restoration of these values needs to continue to be evaluated prior to undertaking actions in the floodplain.

The difficulties of applying the concept of choosing practicable alternatives to action in the floodplain appears to increase as the degree of Federal involvement diminishes. In some cases, Federal agency actions may be limited to the issuance of a permit, provision of insurance or a loan guarantee, or financial assistance for a small portion of a larger project. Despite the limited nature of the Federal action, the decision made by the Federal agency can be a deciding factor in terms of the feasibility of the project. Many of the comments received in regard to this review raised issues concerning the application of the Executive Order concept of practicable alternative to this type of action. One concern expressed in several comments was that the Executive Order might be used to block actions solely to preserve floodplains in their natural state. Another issue raised concerned whether an alternative had to be practicable for the Federal agency, the individual applicant, or both. In several comments from the land development industry it was recommended that potential property damage and threats to human safety, rather than natural and beneficial floodplain values, be used as the criteria for evaluating projects funded primarily by the private sector.

The Executive Order 11988 requirement that Federal agencies determine that there is no practicable alternative to a floodplain location has been misunderstood and has been difficult to apply to some actions that directly involve the private sector. The Executive Order requires that, prior to conducting, supporting, or allowing an action in the floodplain, a Federal agency determine that the floodplain location is the only practicable alternative. Federal agencies are required to evaluate alternative sites for the proposed action, other means to accomplish the same purpose, and the possibility of taking no action at all. Segments of the port industry indicated that within the industry many perceived the Executive Order as prohibiting floodplain development or at least hindering such development to the degree that needed port facilities were not being built. As a solution to this problem it was recommended that port facilities be designated as "functionally dependent uses" and exempted from some or all provisions of the Executive Order. Other comments criticized Federal agencies for being too restrictive or not restrictive enough in applying the Executive Order to actions involving private sector requests for permits, licenses, loan guarantees, or insurance.

Port facilities are generally functionally dependent on waterfront locations. If properly applied, the concept of practicable alternative can adequately accommodate the industry's needs. Clearly, port facilities are functionally dependent on waterfront locations and, as a result, generally will have to be located in floodplains. However, there appears to be no compelling need to modify the Executive Order to provide for special treatment of functionally dependent uses. Proper application of the Executive Order concept of not taking actions in floodplains if there are practicable alternatives should not prohibit the development of port facilities. In such cases, the search for practicable alternatives should lead to the selection of a less-hazardous floodplain location, a location with fewer adverse impacts, or incorporation of mitigation measures in the design of a facility. The problem of functionally dependent uses appears to be primarily one of perception or application rather than the actual content of the Executive Order.

Executive Order 11988 and the National Flood Insurance Program (NFIP)

The difference in criteria between Executive Order 11988 and the NFIP regarding avoidance and the protection of natural and beneficial floodplain values does not make the NFIP inconsistent with the Executive Order. We concur with several comments that indicated that NFIP does not explicitly require avoidance if practicable alternatives are available and that its regulations are not designed to protect natural beneficial floodplain values. However, the overall thrust of the NFIP is consistent with the objectives of Executive Order 11988.

The NFIP is a unique Federal program that depends on voluntary participation by communities to achieve its objectives of preventing flood damages and reducing Federal expenditures for disaster assistance and flood control. Because the quid pro quo for adoption of these floodplain management regulations has been flood insurance coverage on structures, the NFIP criteria appropriately have been primarily oriented towards reducing property damage. The NFIP can continue to progress toward achieving its objectives only so long as communities and individuals in flood-prone areas perceive the benefits of participation as exceeding its costs. Since the vehicles for implementing NFIP criteria are local ordinances which apply to all floodplain development, there are also legal constraints that limit the restrictions that can be placed on floodplain development.

One of the primary reasons for the issuance of Executive Order 11988 was to ensure that all Federal agencies, at a minimum, comply with NFIP floodplain management standards. However, in addition, the order requires Federal agencies to provide leadership in managing the nation's floodplains. It is not inconsistent for the Federal Government to hold itself to higher standards than it demands of the private sector when exercising its discretion when taking, assisting, or allowing an action to take place in the floodplain.

Executive Order 11988 references National Flood Insurance Program (NFIP) criteria as the minimum standard for protection of structures. Issues regarding those criteria are more appropriately addressed as part of the ongoing review of those NFIP criteria. In participating communities, private sector actions must comply with local ordinances which are required to meet or exceed minimum NFIP floodplain management criteria. The Executive Order itself also establishes those criteria as the minimum standard for protection of structures. As a result, issues such as wet-floodproofing, the adoption of a 50-year standard for basements, and changes to the substantial improvement definition could not be addressed without changes to NFIP regulations. This review does not find arguments supporting the relaxation of the substantial improvement definition or use of the 50-year standard for basements persuasive, but regards the wet-floodproofing of functionally dependent uses as potentially a viable alternative under some circumstances. This issue will be examined as part of an on-going regulatory review of NFIP floodplain management criteria, announced in an advance notice of rulemaking published in the Federal Register on December 13, 1982.

Since detailed engineering studies cannot be conducted for all communities or all sources and types of flooding, Federal agencies will have to continue to use best available data to identify floodplains and generate necessary engineering information on a case-by-case basis. A number of comments indicate that a lack of detailed flood data has hindered Executive Order

compliance in many areas. Despite FEMA's ongoing mapping program, there will continue to be many communities or reaches of streams that will not have the development potential to economically justify detailed engineering studies. FEMA will continue to seek ways to inexpensively map less-critical areas and explore methodologies for addressing special hazards such as alluvial fan flooding. Federal agencies which propose actions in areas where floodplains have not been identified or flood elevations not determined will have to continue to use best available data or seek assistance from knowledgeable Federal agencies, the States or private engineering consultants.

Other Issues

Critical actions--those for which even the slightest chance of flooding is too great--warrant a greater degree of protection than that provided by the 100-year base flood standard. Under the WRC Guidelines, the basic standard used in critical actions should be the 500-year, or 0.2 percent chance, flood. This concept of providing added protection for critical actions is consistent with Executive Order objectives to minimize the impacts of floods on human health, safety, and welfare. The Environmental Protection Agency has issued regulations for implementing the Resource Conservation and Recovery Act which apply the 100-year standard to locating sites for storage of hazardous waste. This review regards the EPA RCRA regulations as inconsistent with the objectives. The possibility of the contamination of floodwaters by hazardous waste is an unnecessary risk that is not tolerable. In addition, the Department of Housing and Urban Development should generally regard elderly housing as a critical action.

There needs to be a reasonable degree of consistency among agencies in application of the Executive Order to similar programs and to similar actions. The Executive Order and the WRC Guidelines recognize that there are differences among Federal programs and that some tailoring of the Executive Order provisions to specific needs will be required. However, one of the central thrusts of Federal flood policy has been the development of a uniform approach to these problems. Marked inconsistencies among Federal agencies in application of the Executive Order will undermine the efforts by the Federal government to provide leadership in reducing the nation's flood losses.

IV. CONCLUSIONS AND RECOMMENDATIONS

This review has been conducted to address concerns raised regarding the 100-year base flood standard and Executive Order 11988, Floodplain Management. Chief among these concerns has been the question of whether both have been sufficiently effective in reducing the Nation's flood losses to warrant the expenditures of effort and funds that have been necessary to implement them. In conducting this review, the history, current use, and attitudes of affected parties were analyzed. Useful insights were obtained from the comments received from States, local units of governments, the public, and Federal agencies. In addition, a number of the comments raised issues related to the National Flood Insurance Program rather than directly to Executive Order 11988. The recommendation that wet-floodproofing be permitted as an alternative method of flood protection for port facilities had particular merit and has been referred to the NFIP for consideration in the review of NFIP Floodplain Management Regulations.

100-YEAR BASE FLOOD STANDARD

Findings and Conclusions

1. The 100-year base flood standard is strongly supported and being applied successfully by all levels of government.
2. No alternatives have been identified that are superior to it, and there is no evidence to justify the expenditure of funds that would be necessary to convert to another standard.
3. The review revealed areas in which improvements or refinements in application of the 100-year base flood standard to unique flooding situations could further effect flood loss reduction.

Recommendations

1. The 100-year base flood standard should be retained.
2. The Federal agencies should be advised that the 100-year base flood standard is appropriate and should continue to be utilized as the minimum standard in flood hazard reduction actions.
3. FEMA should take the lead in evaluating mitigating measures that can be applied to reduce flood losses in unique situations such as alluvial fans and headwater flooding and to develop the technical methods of applying the 100-year base flood standard to these problem areas.

EXECUTIVE ORDER 11988, FLOODPLAIN MANAGEMENT

1. Retention of the Executive Order was supported by nearly all responses. Especially strong support was received from the Governors and State agencies.

2. Executive Order 11988 is reducing exposure to potential flood losses by deterring unnecessary siting of activities in high-hazard floodplain locations. However, significant improvements in Federal actions remain to be made to achieve the Order's objectives of reducing both the number of structures and facilities unnecessarily exposed to flood risk and the consequent flood losses.
3. The Order itself contains several minor provisions and references which are obsolete or outdated, but are recognized by implementing agencies as such without any adverse effects on implementation of the Order--e.g., reliance upon the A-95 review process, references to Department of Housing and Urban Development instead of FEMA maps and the location of the consultation responsibility within the FEMA natural hazard unit rather than FIA.
4. Implementation procedures have not been adopted by all agencies and some agencies have adopted procedures which are inconsistent with Executive Order 11988.
5. While Federal agency implementation of the Order has become more effective over time, significant opportunities exist to streamline and improve upon the implementation process, especially for small actions.
6. Some segments of the private sector, appear to have misperceptions about the scope and intent of the Order. Some responses indicate a mistaken belief that the Order prohibits all development in the floodplain.

Recommendations

1. Executive Order 11988 should be retained in its present form without modification.
2. Federal agencies should be advised that the policies contained in the Order are sound and the Order is being retained.
3. The following agencies and subagencies should adopt final implementing procedures for Executive Order 11988:

Department of Agriculture, Farmers
Home Administration
Department of Agriculture, Agricultural
Stabilization and Conservation Service
Federal Energy Regulatory Commission
Department of Housing and Urban Development
Department of State.

Final procedures would remove uncertainty and facilitate proper implementation of the Executive Order.

Federal agencies that have adopted implementing procedures that are inconsistent with the objectives of the Executive Order should revise their implementing procedures into full compliance. These include the

- o Small Business Administration, which exempts all actions for loan assistance under \$300,000 as well as all repairs that are less than 50 percent of fair market value;
 - o Farmers Home Administration, which categorically excludes all repairs to existing facilities;
 - o Environmental Protection Agency, which only applies the minimum 100-year standard to hazardous waste storage facilities. (Because of the threat to health and safety, however, these facilities would be more appropriately categorized as critical actions and should be afforded 500-year protection.)
5. The Federal agencies should review their implementing procedures and determine whether adoption of thresholds or limited categorical exclusions could significantly reduce the time and cost of implementation without loss of overall effectiveness in flood loss reduction. These thresholds and categorical exclusions should be used to identify small actions in which the objectives of the Executive Order can be achieved more efficiently through application of a simplified planning process, but they should not be used to exempt actions from compliance. Any changes should be forwarded to FEMA for comment prior to publication as a proposed rule.
 6. The Federal agencies should ensure that their field offices are fully conversant with Executive Order 11988 and its provisions. In those instances in which deficiencies are identified, Federal agencies should develop clarifying instructions or develop and conduct training programs for their field staff.
 7. The interagency Floodplain Management Task Force should prepare a training document to assist agencies with implementation of the Executive Order.
 8. The Federal agencies should advise groups in the private sector and State and local governments of the intent and provisions of the Executive Order in order to reduce uncertainties and misunderstandings about its application to actions in which they might be involved. It should be made clear that the intent of the Order is not to prohibit floodplain development in all cases but rather to create consistent government policy against such development under most circumstances.

APPENDICES

- A. Executive Order 11988, Floodplain Management
- B. List of Federal Agency Implementing Procedures
- C. Progress Report, Presidential Task Force on Regulatory Relief, -
page 23.
- D. Assignment from the Office of Management and Budget
- E. Notice of Review, Federal Register, October 22, 1982
- F. Index of Comments Received
- G. List of Reference Documents
- H. Government Accounting Office Report to Congress

A. Executive Order 11988, Floodplain Management

NOTICES

the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 *et seq.*), the National Flood Insurance Act of 1968, as amended (42 U.S.C. 4001 *et seq.*), and the Flood Disaster Protection Act of 1973 (Public Law 93-234, 87 Stat. 975), in order to avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative, it is hereby ordered as follows:

SECTION 1. Each agency shall provide leadership and shall take action to reduce the risk of flood loss to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities for (1) acquiring, managing, and disposing of Federal lands and facilities; (2) providing Federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.

SEC. 2. In carrying out the activities described in Section 1 of this Order, each agency has a responsibility to evaluate the potential effects of any actions it may take in a floodplain; to ensure that its planning programs and budget requests reflect consideration of flood hazards and floodplain management; and to prescribe procedures to implement the policies and requirements of this Order, as follows:

(a) 1) Before taking an action, each agency shall determine whether the proposed action will occur in a floodplain—for major Federal actions significantly affecting the quality of the human environment, the evaluation required below will be included in any statement prepared

E.O. 11988—Floodplain Management

By virtue of the authority vested in me by the Constitution and statutes of the United States of America, and as President of the United States of America, in furtherance of

NOTICES

under Section 102(2)(C) of the National Environmental Policy Act. This determination shall be made according to a Department of Housing and Urban Development (HUD) floodplain map or a more detailed map of an area, if available. If such maps are not available, the agency shall make a determination of the location of the floodplain based on the best available information. The Water Resources Council shall issue guidance on this information not later than October 1, 1977.

(2) If an agency has determined to, or proposes to, conduct, support, or allow an action to be located in a floodplain, the agency shall consider alternatives to avoid adverse effects and incompatible development in the floodplain. If the head of the agency finds that the only practicable alternative consistent with the law and with the policy set forth in this Order requires siting in a floodplain, the agency shall, prior to taking action, (i) design or modify its action in order to minimize potential harm to or within the floodplain, consistent with regulations issued in accord with Section 2(d) of this Order, and (ii) prepare and circulate a notice containing an explanation of why the action is proposed to be located in the floodplain.

(3) For programs subject to the Office of Management and Budget Circular A-95, the agency shall send the notice, not to exceed three pages in length including a location map, to the state and areawide A-95 clearinghouses for the geographic areas affected. The notice shall include: (i) the reasons why the action is proposed to be located in a floodplain; (ii) a statement indicating whether the action conforms to applicable state or local floodplain protection standards and (iii) a list of the alternatives considered. Agencies shall endeavor to allow a brief comment period prior to taking any action.

(4) Each agency shall also provide opportunity for early public review of any plans or proposals for actions in floodplains, in accordance with Section 2(b) of Executive Order No. 11514, as amended, including the development of procedures to accomplish this objective for Federal actions whose impact is not significant enough to require the preparation of an environmental impact statement under Section 102(2)(C) of the National Environmental Policy Act of 1969, as amended.

(b) Any requests for new authorizations or appropriations transmitted to the Office of Management and Budget shall indicate, if an action to be proposed will be located in a floodplain, whether the proposed action is in accord with this Order.

(c) Each agency shall take floodplain management into account when formulating or evaluating any water and land use plans and shall require land and water resources use appropriate to the degree of hazard involved. Agencies shall include adequate provision for the evaluation and consideration of flood hazards in the regulations and operating procedures for the licenses, permits, loans or grants-in-aid programs that they administer. Agencies shall also encourage and provide appropriate guidance to applicants to evaluate the effects of their proposals in floodplains prior to submitting applications for Federal licenses, permits, loans or grants.

(d) As allowed by law, each agency shall issue or amend existing regulations and procedures within one year to comply with this Order. These procedures shall incorporate the Unified National Program for Floodplain Management of the Water Resources Council, and shall explain the means that the agency will employ to pursue the nonhazardous use of riverine, coastal and other floodplains in connection with the

NOTICES

activities under its authority. To the extent possible, existing processes, such as those of the Council on Environmental Quality and the Water Resources Council, shall be utilized to fulfill the requirements of this Order. Agencies shall prepare their procedures in consultation with the Water Resources Council, the Federal Insurance Administration, and the Council on Environmental Quality, and shall update such procedures as necessary.

SEC. 3. In addition to the requirements of Section 2, agencies with responsibilities for Federal real property and facilities shall take the following measures:

(a) The regulations and procedures established under Section 2(d) of this Order shall, at a minimum, require the construction of Federal structures and facilities to be in accordance with the standards and criteria and to be consistent with the intent of those promulgated under the National Flood Insurance Program. They shall deviate only to the extent that the standards of the Flood Insurance Program are demonstrably inappropriate for a given type of structure or facility.

(b) If, after compliance with the requirements of this Order, new construction of structures or facilities are to be located in a floodplain, accepted floodproofing and other flood protection measures shall be applied to new construction or rehabilitation. To achieve flood protection, agencies shall, wherever practicable, elevate structures above the base flood level rather than filling in land.

(c) If property used by the general public has suffered flood damage or is located in an identified flood hazard area, the responsible agency shall provide on structures, and other places where appropriate, conspicuous delineation of past and probable flood height in order to en-

hance public awareness of and knowledge about flood hazards.

(d) When property in floodplains is proposed for lease, easement, right-of-way, or disposal to non-Federal public or private parties, the Federal agency shall (1) reference in the conveyance those uses that are restricted under identified Federal, State, or local floodplain regulations; and (2) attach other appropriate restrictions to the uses of properties by the grantee or purchaser and any successors, except where prohibited by law; or (3) withhold such properties from conveyance.

SEC. 4. In addition to any responsibilities under this Order and Sections 202 and 205 of the Flood Disaster Protection Act of 1973, as amended (42 U.S.C. 4106 and 4128), agencies which guarantee, approve, regulate, or insure any financial transaction which is related to an area located in a floodplain shall, prior to completing action on such transaction, inform any private parties participating in the transaction of the hazards of locating structures in the floodplain.

SEC. 5. The head of each agency shall submit a report to the Council on Environmental Quality and to the Water Resources Council on June 30, 1978, regarding the status of their procedures and the impact of this Order on the agency's operations. Thereafter, the Water Resources Council shall periodically evaluate agency procedures and their effectiveness.

SEC. 6. As used in this Order:

(a) The term "agency" shall have the same meaning as the term "Executive agency" in Section 105 of Title 5 of the United States Code and shall include the military departments; the directives contained in this Order, however, are meant to apply only to those agencies which perform the activities described in Section 1 which are located in or affecting floodplains.

NOTICES

(b) The term "base flood" shall mean that flood which has a one percent or greater chance of occurrence in any given year.

(c) The term "floodplain" shall mean the lowland and relatively flat areas adjoining inland and coastal waters including floodprone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year.

SEC. 7. Executive Order No. 11296 of August 10, 1966, is hereby revoked. All actions, procedures, and issuances taken under that Order and still in effect shall remain in effect until modified by appropriate authority under the terms of this Order.

SEC. 8. Nothing in this Order shall apply to assistance provided for emergency work essential to save lives and protect property and public health and safety, performed pursuant to Sections 305 and 306 of the Disaster Relief Act of 1974 (88 Stat. 148, 42 U.S.C. 5145 and 5146).

SEC. 9. To the extent the provisions of Section 2(a) of this Order are applicable to projects covered by Section 104(h) of the Housing and Community Development Act of 1974, as amended (88 Stat. 640, 42 U.S.C. 5304(h)), the responsibilities under those provisions may be assumed by the appropriate applicant, if the applicant has also assumed, with respect to such projects, all of the responsibilities for environmental review, decisionmaking, and action pursuant to the National Environmental Policy Act of 1969, as amended.

JIMMY CARTER.

The White House,
May 24, 1977.

APPENDIX D—E.O. 11990 PROTECTION OF WETLANDS Statement by the President Accompanying E.O. 11990

The Nation's coastal and inland wetlands are vital natural resources of critical importance to the people of this country. Wetlands are areas of great natural productivity, hydrological utility, and environmental diversity, providing natural flood control, improved water quality, recharge of aquifers, flow stabilization of streams and rivers, and habitat for fish and wildlife resources. Wetlands contribute to the production of agricultural products and timber, and provide recreational, scientific, and aesthetic resources of national interest.

The unwise use and development of wetlands will destroy many of their special qualities and important natural functions. Recent estimates indicate that the United States has already lost over 40 percent of our 120 million acres of wetlands inventoried in the 1950's. This piecemeal alteration and destruction of wetlands through draining, dredging, filling, and other means has had an adverse cumulative impact on our natural resources and on the quality of human life.

The problem of loss of wetlands arises mainly from unwise land use practices. The Federal Government can be responsible for or can influence these practices in the construction of projects, in the management of its own properties, and in the provisions of financial or technical assistance.

In order to avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative, I have issued an Executive order on the protection of wetlands.

B. List of Federal Agency Implementing Procedures

February 22, 1983

AGENCY IMPLEMENTATION PROCEDURES

FOR E.O. 11988

Department of Agriculture	FINAL	- Secretary's Memorandum No. 1827, Revised, October 30, 1978
Soil Conservation Service	FINAL	- <u>Federal Register</u> , July 30, 1979
Rural Electrification Administration	FINAL	- REA Bulletin, January 21, 1980
Economic Research Service	FINAL	- Secretary's Memorandum No. 1827, Revised, October 30, 1978
Farmers Home Administration ...	PROPOSED	- <u>Federal Register</u> , September 14, 1978
Forest Service	FINAL	- Forest Service Manual, Pt. 2527, July 1981
Agricultural Research Service .	FINAL	- Secretary's Memorandum No. 1827, Revised, October 30, 1978
Agricultural Stabilization and Conservation Service	PROPOSED	- <u>Federal Register</u> , March 14, 1980
Cooperative Extension Service .	FINAL	- Secretary's Memorandum No. 1827, Revised, October 30, 1978
Department of Commerce	FINAL	- <u>Federal Register</u> , May 23, 1979
Economic Development Administration	FINAL	- <u>Federal Register</u> , August 31, 1979
National Oceanic and Atmos- pheric Administration	FINAL	- Internal Directive, November 10, 1979
Department of Defense (Mil. Const.)	FINAL	- <u>Federal Register</u> , March 6, 1978
Department of Air Force (Mil. Const.).....	FINAL	- Design Manual, December 22, 1978
Department of Navy (Mil. Const.).....	FINAL	- Design Manual, August 1979
Department of Army		NAFAC Inst. 11010.14M
(Mil. Const.)	FINAL	- Internal Directive, May 22, 1978
(Civil Works) Corps of Engineers.....	FINAL	- <u>Federal Register</u> , May 16, 1979
(Regulatory Programs) Corps of Engineers	FINAL	- <u>Federal Register</u> , July 22, 1982
Department of Education	FINAL	- Disaster Assistance Manual, February 1982

Department of Energy	FINAL	- <u>Federal Register</u> , March 7, 1979
Federal Energy Regulatory		
Commission	PROPOSED	- <u>Federal Register</u> , March 7, 1979
Bonneville Power Adminis-		
tration	FINAL	- Internal Procedures, March 10, 1980
Environmental Protection		
Agency	FINAL	- <u>Federal Register</u> , January 5, 1979
Office of Air Quality		
Planning and Standards	NONE	
Office of Drinking Water	NONE	(October 1979)*
Office of Enforcement	FINAL	- <u>Federal Register</u> , June 7, 1979
Office of Environmental	FINAL/	- <u>Federal Register</u> , January 7,
Review	INTERIM	1983
Office of Solid Waste		
Management	**	
State Plans	FINAL	- <u>Federal Register</u> , April 1, 1983
Disposal Facilities	FINAL	- <u>Federal Register</u> , May 19, 1980
Hazardous Waste Permits ...	FINAL	- <u>Federal Register</u> , January 12, 1981
Office of Water Planning and		
Standards	FINAL	- <u>Federal Register</u> , May 23, 1979
Office of Water Program		- Handbook, January 1977
Operations	FINAL	

** The Office of Solid Waste Management will be reflecting the Order's requirements in the three sets of referenced procedures.

Federal Emergency Management		
Agency	FINAL	- <u>Federal Register</u> , September 9, 1980
General Services Administration	FINAL	- <u>Federal Register</u> , August 1, 1979
Department of Health and Human		
Services	FINAL	- <u>Federal Register</u> , November 19, 1980
Department of Housing and		
Urban Development.....	PROPOSED	- <u>Federal Register</u> , August 9, 1979
Department of the Interior	FINAL	- <u>Federal Register</u> , June 20, 1979
Fish and Wildlife	FINAL	- <u>Federal Register</u> , November 29, 1979
Heritage Conservation and		
Recreation Service		(Functions transferred to the National Park Service, 1980)

National Park Service	FINAL	- <u>Federal Register</u> , August 23, 1982
Bureau of Land Management	FINAL	- <u>Federal Register</u> , March 15, 1979
Bureau of Reclamation	FINAL	- <u>Federal Register</u> , July 17, 1979
Bureau of Indian Affairs	PROPOSED	- <u>Federal Register</u> , October 1, 1979
Office of Surface Mining	FINAL	- <u>Federal Register</u> , July 25, 1980
Bureau of Mines	FINAL	- <u>Federal Register</u> , August 8, 1980
Geological Survey	INTERIM	- <u>Federal Register</u> , May 30, 1980
Mineral Management Service	FINAL/ INTERIM *	

- * The Minerals Management Service, formed in 1981, includes activities formerly performed by the Bureau of Land Management and the Geological Survey. Sections of the Bureau of Land Management's final floodplain rule and the Geological Survey's interim floodplain rules now cover the Minerals Management Services activities.

International Boundary and Water Commission, United States and Mexico	FINAL	- <u>Federal Register</u> , December 29, 1978
Department of Justice	FINAL	- <u>Federal Register</u> , July 30, 1980
Department of Labor	FINAL	- Secretary's Order 4-80, June 27, 1980
National Aeronautics and Space Administration	FINAL	- <u>Federal Register</u> , January 4, 1979
National Capital Planning	FINAL	- <u>Federal Register</u> , October 19, 1981
Commission		
Nuclear Regulatory Commission ...	Internal Agency Procedures Adopted per	<u>Federal Register</u> , October 6, 1978
U.S. Postal Service	FINAL	- <u>Federal Register</u> , April 17, 1981
Small Business Administration ...	INTERIM	- <u>Federal Register</u> , October 28, 1978
Department of State (provided by)		
Bureau of Oceans and Inter- national Environmental and Scientific Affairs	INFORMAL DRAFT	- September 1978
Tennessee Valley Authority	FINAL	- <u>Federal Register</u> , August 11, 1979

Department of Transportation *... FINAL - Federal Register, April 26, 1979

Federal Highway Administration FINAL - Federal Register, November 26, 1979

- * DOT indicates that the following subagency units have adopted the DOT-wide directive as their own: Federal Aviation Administration, Urban Mass Transit Administration, Saint Lawrence Seaway Development Corporation, U.S. Coast Guard, Federal Railroad Administration, and Maritime Administration.

Veterans Administration FINAL - Federal Register, August 22, 1978

Water Resources Council*

Title I FINAL - Federal Register, February 10, 1978

Title I FINAL - Federal Register, September 29, 1978

Title II FINAL - Federal Register, November 30, 1980

Title III FINAL - Federal Register, October 30, 1980

- * The Water Resources Council is reflecting the Order's requirements in the referenced procedures.

C. Progress Report, Presidential Task Force on Regulatory Relief, -
page 23.

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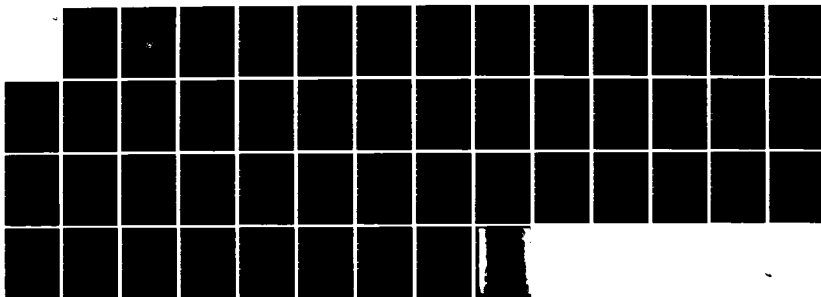
THE 100-YEAR BASE FLOOD STANDARD AND THE FLOODPLAIN
MANAGEMENT EXECUTIVE (U) FEDERAL EMERGENCY MANAGEMENT
AGENCY WASHINGTON DC SEP 83

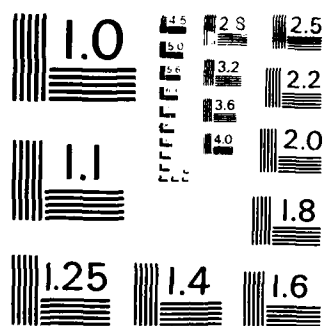
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REAGAN ADMINISTRATION ACHIEVEMENTS IN REGULATORY RELIEF FOR STATE AND LOCAL GOVERNMENT

A Progress Report



Presidential Task Force on Regulatory Relief
August 1982

air quality standards. EPA generally evaluates each part of a state's plan by comparing it with EPA's detailed guidance, and may disapprove the plan if it falls short of any EPA requirements, even if another part of the plan more than makes up the difference. This process has discouraged states from proposing alternative approaches which might be equally effective in improving air quality. For example, several states have unsuccessfully proposed "New Source Review" programs which, though different from EPA's requirements, may have an equivalent effect on air quality. EPA will develop new policies to make it easier to approve "equivalent" State Implementation Plans, beginning with a review of New Source Review requirements.

8. FEMA/Executive Order 11988--Floodplain Management.

Executive Order 11988 was issued in 1977 to minimize the use of federal funds to support direct or indirect land development in floodplains. The Order provides that a federal agency may conduct or support development in a floodplain only after performing an analysis which determines that no practicable alternatives are available. Once the agency determines that floodplain development is the only option, the Order requires that the agency comply with relevant regulations and procedures dealing with construction in floodplains. FEMA will investigate whether federal agencies are complying with the requirements of the Order, and what impact (if any) there has been on the level of federal support in designated floodplain areas. Another issue to be reviewed is the use of the "base flood" standard embodied in the Order. For a number of years, FEMA has used the "base flood"--which means a flood which has a one percent or greater chance of occurrence in any given year--as a standard in its flood insurance programs. There has been a great deal of debate as to the appropriateness of this standard. Since this Executive Order is the only legal authority for its use, the standard will be reviewed as part of the reexamination of the floodplain management program.

D. Assignment from the Office of Management and Budget



OFFICE OF THE VICE PRESIDENT
WASHINGTON

AUG 26 1982

Mr. George Jett
General Counsel
Federal Emergency Management Agency
500 C Street, N.W.
Washington, D.C. 20472

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Dear Mr. Jett:

A major goal of the Administration is to identify and eliminate unnecessary federal regulatory requirements. Under the auspices of the Presidential Task Force on Regulatory Relief, we have made significant progress in reducing federal regulation and paperwork. On August 4, 1982, the Task Force released the enclosed report, describing our achievements to date in reducing the regulatory burden on State and local governments and identifying eight additional regulatory areas for review. As you know, one of the new reviews concerns Executive Order 11988 on floodplain management, for which the Federal Emergency Management Agency (FEMA) is responsible.

The primary responsibility for conducting this review rests with FEMA. The description on page 23 of the enclosed report describes the general scope of the review. As a first step in getting this review underway, I would appreciate it if you could provide me, by September 10, 1982, with a plan and schedule for conducting the review. I would also like to know the name of the individual within FEMA who will be responsible for this review.

We would like to complete this review by March 1983. Accordingly, it is critical that action begin immediately. Should you have any questions or comments, please contact Mr. Kenneth Allen of my office, who will be the point of contact for the Task Force on this review.

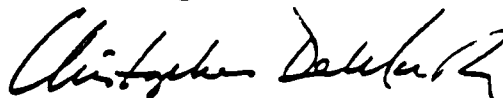
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I would like to stress the importance of your thorough and expeditious evaluation of this program. Over the past year we have been very successful in stemming the tide of major new regulatory pressures on our economy. Yet this is not sufficient. It is essential that we recognize that the existing regulatory programs frequently function as a major impediment to the efficient use of resources in our society. If the Administration's economic recovery program is to be successful, it is crucial that we review existing programs rigorously, keeping in mind the need to achieve our programmatic goals as efficiently and effectively as possible while minimizing unnecessary paperwork and compliance expenditures.

I look forward to your assistance in achieving this important Administration goal.

Sincerely,



Christopher DeMuth
Executive Director
Presidential Task Force
on Regulatory Relief

Enclosure

E. Notice of Review, Federal Register, October 22, 1982

FEDERAL EMERGENCY MANAGEMENT AGENCY

Regulatory Review: Executive Order 11988 and 100 Year Flood Standard

I. Statement of Issue

By letter of August 28, 1982, the Office of Management and Budget directed the Federal Emergency Management Agency (FEMA) to conduct a review of Executive Order 11988, Floodplain Management, and the standard of the 100 year frequency flood. The basic issues involved in this review are:

1. Are Federal agencies complying with Executive Order 11988?
2. What impact, if any, has there been on the level of Federal support of unwise actions in designated floodplain areas?
3. Is the 100 year flood standard appropriate?

II. Request for Views of Public

In its review of Executive Order 11988 (42 FR 28951), FEMA will rely heavily on public input and documentation to determine whether, and to what extent, the Federal agencies are complying with Executive Order 11988. We invite responses to the six questions posed in section V.F. below.

III. Information Due Date

December 15, 1982.

IV. Agency Contact

All information and any questions should be directed to: Richard Sanderson, Chief, Natural Hazards Division, Office of State and Local Programs Federal Emergency Management Agency, 500 C Street, SW., Washington, D.C. 20472, (202) 287-0270.

V. Executive Order 11988, Floodplain Management

A. Background.

In May, 1977, President Carter issued Executive Order 11988, Floodplain Management. Section 7 of Executive Order 11988 revoked Executive Order 11296 of August, 1966. Executive Order 11296 directed Federal agencies to provide leadership in preventing uneconomic use and development of floodplains and reducing flood losses. The agencies responsible for (1) the construction of Federal structures and facilities, (2) the administration of Federal grant loan or mortgage insurance programs involving the construction of structures and facilities, and (3) the disposal of Federal properties, were directed to evaluate flood hazards in connection with their actions and, as far as practicable,

preclude the uneconomic, hazardous or unnecessary use of floodplains.

Two events in particular lead from Executive Order 11296 to its successor Executive Order 11988. First, Congress passed the legislation which now comprises the National Flood Insurance Program (NFIP). The National Flood Insurance Act of 1968, *as amended* and the Flood Disaster Protection Act of 1973, *as amended*, authorize the Federal Government to provide flood insurance and condition eligibility for Federal assistance to build or acquire buildings in floodplains on adoption and enforcement of adequate floodplain management ordinances. Thus, the Federal Government provides flood insurance and other Federal benefits but in return expects the recipients of such benefits to protect the Federal investment against the flood hazard by building properly in the floodplain.

The local floodplain management ordinances adopted pursuant to the NFIP are constrained in a number of ways. Most importantly, as a general matter they do not have jurisdiction over the actions of the Federal Government. Thus, a Federal agency could build in a manner inconsistent with the local floodplain ordinance, or so as to aggravate the community's flood hazard. Further, the local ordinances do not, for the most part, apply to facilities other than insurable structures (walled and roofed buildings). Bridges, roads, sewage treatment plants, dams and levees are a few examples of projects generally not subject to local floodplain requirements (except that they may not be built so as to increase flood levels in the community). Finally, the local ordinances generally do not indicate where structures may be built, only how they may be built.

The second event which contributed to the need for Executive Order 11988 was a report by the Comptroller General, "National Attempts To Reduce Losses From Floods By Planning For and Controlling The Uses of Flood-Prone Lands" (March 7, 1975). The report concluded that in programs for financing and insuring new and existing structures and in disposing of property:

Federal agencies had not assumed a leadership role—as directed by Executive Order 11296—and had not adequately evaluated flood hazards in administering their programs for one or more of the following reasons:

Policies and procedures had not been established for evaluating hazards for many programs.

The policies and procedures established frequently failed to identify flood frequency criteria.

The established policies and procedures were inconsistent for comparable programs. The established policies and procedures had not been adequately implemented. (pp. 21-22).

Executive Order 11988 was promulgated, at least in part, in response to the National Flood Insurance Program (NFIP) and the Comptroller General's report. It was not considered wise public policy for the Federal Government to be action in violation of Federally prescribed, but locally adopted floodplain management criteria. Nor was it sound public policy for the Federal Government to foster unwise floodplain development, to increase the flood hazard in local communities, or to stimulate unwise private floodplain development.

B. Purpose.

To ensure that the Federal Government upheld its commitment to a national program of floodplain management and did not simply impose requirements on State and local governments, and to address the problems raised in the Comptroller General's report, Executive Order 11988 was issued. In a statement accompanying the Order, it was recognized that unwise floodplain development can lead to the loss of life and property, and "it is simply a bad Federal investment and should be avoided." In practice, Executive Order 11988 rarely applies to an action unless Federal tax dollars are involved.

C. Provisions.

There are two basic requirements of executive Order 11988. Prior to conducting, supporting or allowing and action in a floodplain, the agency must (1) determine that the floodplain is the only practicable location for such action and (2) if the floodplain is the only practicable location, design or modify the action so as to minimize harm to or within the floodplain. Essentially, the agency must try to avoid the floodplain if practicable and if the action must be in the floodplain, the agency must take the necessary steps to protect it against flooding. Executive Order 11988 does not prohibit Federal assistance in floodplains. It does require a case by case determination of whether safer locations are practicable sites for an action, and application of sound building practices to facilities built in the floodplain.

The Order applies to Federal actions involving (1) acquiring, managing and disposing of Federal lands and facilities;

(2) providing Federally undertaken, financed or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating and licensing activities.

Executive Order 11988 applies to the Federal actions identified above which are proposed to be taken in the 100 year floodplain. That is the area subject to a one percent or greater chance of flooding in any given year.

There are also a few procedural requirements stemming from the Order. First, the agency must provide early notice to the public on proposals for action and alternative courses of action. If the head of an agency finds there is no practicable alternative to locating in a floodplain, then the public must be informed of this fact. Each agency was also required to issue or amend existing regulations by May 24, 1978, to comply with the Order.

D. Issues

In the course of its review, FEMA will examine the provisions of Executive Order 11988 to determine if the requirements contained therein are reasonable and promote wise public policy. FEMA will review the wisdom of requiring avoidance of the floodplain unless it is the only practicable location and of providing for minimization of harm to and within the floodplain. FEMA will look into the reasonableness of these requirements and whether, if complied with, they will achieve the objective of reducing Federal support for unwise floodplain actions. FEMA will also examine the usefulness of the public notice requirements of Executive Order 11988. FEMA will review the appropriateness of the more specific provisions of the Order including those involving delineation of flood heights on public structures, disposal of public property, notice of flood hazards in connection with financial transactions, and authorization and appropriation requests to the Office of Management and Budget.

E. Procedural Compliance

Agencies are required to have promulgated regulations implementing Executive Order 11988. Most agencies established such regulations and did so in consultation with the Water Resources Council (WRC), the Council on Environmental Quality (CEQ) and FEMA. We intend to survey the Federal agencies to determine the date and contents of the most recent version of their regulations. We will also seek any handbooks, policy papers or other guidance to central and field offices

which implement Executive Order 11988. The regulations, handbooks, and other material will be reviewed for their adequacy in implementing the Order.

F. Substantive Compliance

FEMA will analyze whether agency procedures are being acted upon, and adequately implemented. It must be determined if the policies and requirements of Executive Order 11988 are finding their way into agency decision-making. To collect the facts necessary to conduct this aspect of the review, FEMA is seeking input from any interested individual, or public or private entity with information responsive to any or all the following questions regarding Federal actions:

1. Are actions going into the floodplain which should not be?
2. Are actions not going into the floodplain which should be?
3. Are flood risks being assessed adequately?
4. Are structures and facilities being adequately protected against the flood hazard?
5. Are actions being delayed as a result of compliance with Executive Order 11988? If so, do benefits result from the extra time taken to review the floodplain aspects of a project?
6. Has there been a change in the level of Federal support for unwise floodplain actions as a result of Executive Order 11988? Why or why not?

We would appreciate factually based answers which provide ample rationale. Specific examples documenting the conclusions would be quite helpful.

VL 100 Year Flood Standard

A. Description

The 100 year flood is that flood that has a one percent or greater chance of occurring in a given year. In a slightly different light, it is the flood that has a 26 percent chance of occurring during the life of a 30 year mortgage.

B. Background

The 100 year flood standard was adopted by the Federal Insurance Administration based on a recommendation of a conference of experts which took place in 1968. The conference determined that the 100 year standard was the most realistic and equitable basis for floodplain planning and construction.

Though the 100 year flood is not specifically in either the 1968 or 1973 flood acts, it did receive the imprimatur of the Senate Committee on Banking, Housing and Urban Affairs (S. Rep. No. 93-583, 1973). The Committee held extensive hearings, and brought before it experts and representatives of diverse interests.

It found that the 100 year standard had been adopted by virtually every Federal agency and most State agencies. The Committee concluded:

After careful consideration, the Committee agreed that the 100-year standard or the flood that has a one percent chance of occurrence is reasonable and consistent with nationwide standards for flood protection. (P. 5).

By virtue of 1974 amendments to the National Flood Insurance Act of 1968 (§ 1307(e)), Congress applied the 100 year flood standard as the minimum level of protection which must be afforded by a flood protection project under the flood insurance program.

C. Application

The 100 year standard has widespread application. As indicated, most states and virtually every Federal agency had adopted it even prior to Executive Order 11988 and the 1973 Senate Committee Report. More importantly, it is presently in effect in over 17,000 communities nationwide that are participating in the National Flood Insurance Program. These communities have a FEMA map which at the least delineates the boundary of the 100 year floodplain and will often (where detailed engineering studies have been completed) identify the level of the 100 year flood. On the basis of these maps, the local government requires building permits for all floodplain development and elevation of the lowest floor of all new structures to the level of the 100 year flood. This system has been in place for the fourteen years that the flood insurance program has been in existence. The flood insurance rates applied to new construction are dependent on the level of the 100 year flood.

Even though, as the Senate Report indicates, most Federal agencies had already adopted the 100 year standard by 1973, Executive Order 11988 formally required application of the standard in 1977. As a result, the 100 year standard has been the basis of the regulations and procedures of almost all of the agencies.

D. Issues

Because the 100 year standard is used nationwide, and because it often results in somewhat higher construction costs, it is meaningful to take another look at the standard to determine if it is appropriate or if there is a more effective alternative.

FEMA will review the question of whether the 100 year standard is sufficiently sensitive to local conditions. Does the 100 year standard account for local conditions and, if not, are there practical alternatives to achieve this result?

FEMA will also address the question of whether the 100 year flood standard takes into account a sufficient range of risk factors. Does the standard adequately account for water height, velocity of flow, frequency of flooding, quality of flood water, historical flood loss experience, socioeconomic costs and maximum average annual damage? If the 100 year standard does not account for these risk factors, should it account for them? What steps could and should be taken to address the appropriate risk factors?

VII. Due Date

FEMA will report to the Office of Management and Budget in May, 1983.

Dated: October 19, 1982.

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Associate Director, Office of State and Local Programs and Support.

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H. Government Accounting Office Report to Congress



REPORT TO THE CONGRESS

National Attempts To Reduce Losses From Floods By Planning For And Controlling The Uses Of Flood-Prone Lands

Multiagency

*BY THE COMPTROLLER GENERAL
OF THE UNITED STATES*

RED-75-327

MARCH 7, 1975

COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-167790

To the President of the Senate and the
Speaker of the House of Representatives

This is our report on national attempts to reduce losses from floods by planning for and controlling the uses of flood-prone lands.

We made our review pursuant to the Budget and Accounting Act, 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

We are sending copies of this report to the Director, Office of Management and Budget; the Secretaries of Defense; the Army; the Air Force; the Navy; Agriculture; Health, Education, and Welfare; and Housing and Urban Development; the Administrators of General Services and Veterans Affairs; and the Chairmen of the Tennessee Valley Authority and the Water Resources Council.

Thomas P. Staats

Comptroller General
of the United States

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ABBREVIATIONS

DOD	Department of Defense
FIA	Federal Insurance Administration
FmHA	Farmers Home Administration, Department of Agriculture
GAO	General Accounting Office
GSA	General Services Administration
HEW	Department of Health, Education, and Welfare
HUD	Department of Housing and Urban Development
OMB	Office of Management and Budget
SCS	Soil Conservation Service, Department of Agriculture
TVA	Tennessee Valley Authority
VA	Veterans Administration
WRC	Water Resources Council

GLOSSARY

Flood	An overflow of water on lands not normally covered by water, which are used or usable by man. Floods have two essential characteristics: the inundation of land is temporary and the land is adjacent to and inundated by overflow from a river, stream, ocean, lake, or other body of standing water.
Flood Frequency	A statistical expression of the probability of recurrence for a flood of a given magnitude. For example, a 100-year flood has a magnitude that may be equaled or exceeded once every hundred years, on the average; such a flood has a 1-percent chance of being equaled or exceeded in any given year.
Flood Hazard	The risk to life or damage to property from flooding.
Flood Hazard Analyses Report	A report prepared by the Soil Conservation Service, U.S. Department of Agriculture, on the flood hazard in a given area.
Flood Insurance Study Report	A report prepared for the Federal Insurance Administration (FIA), Department of Housing and Urban Development, on the flood hazard in a given area. These reports, prepared by any one of several Federal, State, or regional agencies--primarily the Corps of Engineers--or by engineering consultants, under contract with FIA, are used to estimate damages over a period of years and to determine actuarial rates for the Federal flood insurance program administered by FIA.
Flood Plain	The areas adjoining a river, stream, watercourse, ocean, lake, or other body of standing water that have been or may be covered by floodwater.

Flood Plain Information Report	A report prepared by the Corps of Engineers on the flood hazard in a given area.
Flood Plain Management	A program intended to lessen the damaging effects of floods and to make effective use of related water and land resources within the flood plain. It attempts to balance the use of flood plains with potential losses. Some available techniques are controlling land use in flood plains, flood proofing buildings in the flood plain, establishing flood-warning and evacuation systems, and using structural measures.
Flood Proofing	A combination of structural changes and adjustments to new or existing structures primarily to reduce or eliminate flood damages. Some flood-proofing techniques are using landfill to raise the site for a new building, placing a new building on stilts and using the ground level for parking, adding flood shields for windows and doors, and installing sump pumps.
Floodway	That section of a flood plain which is required to convey a selected flood flow without substantially increasing flood heights.
Intermediate Regional Flood or 100-Year Flood	A term used by the Corps of Engineers to designate a flood having an average frequency occurrence on the order of once every 100 years, although it may occur in any year.
Nonstructural Measures	Any measure, other than structural, designed to reduce flood damage and damage potential.
Standard Project Flood	A term used by the Corps of Engineers to designate a flood resulting from the most severe combination of meteorological and hydrological conditions that are considered

reasonably characteristic of the area, excluding extremely rare combinations. Peak discharges for these floods are generally about 40 to 60 percent of the probable maximum floods for the same areas.

Structural
Measures

Flood control projects designed to lower flood heights or provide barriers against flood waters.

COMPTROLLER GENERAL'S
REPORT TO THE CONGRESS

NATIONAL ATTEMPTS TO
REDUCE LOSSES FROM FLOODS BY
PLANNING FOR AND CONTROLLING
THE USES OF FLOOD-PRONE LANDS
Multiagency

D I G E S T

WHY THE REVIEW WAS MADE

The Federal Government has invested about \$9 billion in flood protection works; however, since the adoption of a national flood control policy in 1936, annual losses from floods have increased steadily and exceed an estimated \$1 billion annually.

In 1966 the Task Force on Federal Flood Control Policy concluded that through planning and by controlling and regulating the uses of flood-prone lands, disastrous flood losses could be largely curtailed.

The task force--established by the President--proposed a unified national program for reducing losses. The President then directed that Federal agencies provide leadership for States, local governments, and others in reducing flood loss potential.

GAO made this review to inform the Congress about the effectiveness of the unified program.

GAO's work covered 11 Federal agencies, 6 States--Missouri, Nebraska, North Carolina, Tennessee, Texas, Virginia--and 44 local governments in those States. (See app. I.)

FINDINGS AND CONCLUSIONS

There has been little progress toward curtailing disastrous flood losses by planning for and controlling the uses of flood-prone lands. Development of such lands has continued, making the program's objective more difficult to achieve. (See p. 42.)

Federal agencies did not
evaluate flood hazards
adequately

In 1966 the President directed Federal agencies to evaluate flood hazards in their (1) construction and disposal programs and (2) grant, loan, and mortgage insurance programs involving public and private facilities.

He directed the agencies to take such actions as precluding hazardous use of flood plains, applying flood-proofing measures to existing facilities, attaching use restrictions when selling flood-prone Federal properties, and withholding Federal flood-prone properties from disposal. (See p. 8.)

In the Department of Housing and Urban Development, Veterans Administration, and Farmers

Home Administration programs for financing and insuring new and existing houses, the Federal agencies had not adequately evaluated the possible effects of flood hazards for one or more of the following reasons. Policies and procedures (1) had not been established for evaluating hazards for many programs, (2) frequently failed to identify flood frequency criteria, (3) were inconsistent for comparable programs, and (4) had not been adequately implemented.

The General Services Administration, Housing and Urban Development, and Veterans Administration programs for disposing of property likewise had not provided adequate evaluations of flood hazards. (See p. 21.)

Housing and Urban Development did not take adequate action to deal with the flood hazard on 32 of 40 grant, loan, and mortgage insurance projects involving new construction located in or near 100-year flood plains.

In one case, Housing and Urban Development gave preliminary approval in June 1972 for mortgage insurance of \$690,000 on a 60-unit multifamily project in Texas. After GAO discussed the project with Housing and Urban Development officials, they obtained information from the Corps of Engineers which showed that a 100-year flood would cover the first floor of the units with up to 4 feet of water. Housing and Urban Development subsequently withdrew its approval. (See pp. 13 and 14.)

When Federal agencies do not evaluate a flood hazard adequately, they not only endanger the Federal investment but

- subject owners of property to potential personal hardships,

- encourage unwise use and development of flood-prone areas which may be used to justify the construction of flood control projects that would not be necessary if such use and development had not occurred, and

- increase the potential for expenditure of Federal funds for disaster relief. (See p. 11.)

Need for Federal agencies to place greater emphasis on providing technical assistance

The Corps of Engineers, the Soil Conservation Service of the Department of Agriculture, and the Tennessee Valley Authority are responsible for providing localities with information on the scope and nature of flood hazards (flood plain information reports) and technical expertise on how to use this information needed for planning and regulating the use of flood-prone lands.

The Corps of Engineers and the Soil Conservation Service have made limited progress in providing this assistance because of insufficient funding.

The Federal Insurance Administration of Housing and Urban

Development has stated that there are about 21,600 flood-prone communities. As of December 31, 1974, Federal agencies had provided the essential information on the scope and nature of flood hazards to about 3,300 communities. (See pp. 25, 26, 32, and 33.)

The Corps' flood plain information reports are voluminous, containing considerable historical background data. Sometimes, the Corps prepared shorter and less costly versions which appeared to provide the essential data on the flood hazard but did not include historical background. Some of the Soil Conservation Service reports were similar to the traditional Corps reports.

Preparation of the shorter version of the reports would permit the preparation of more reports within available resources. (See pp. 28 and 32.)

The Tennessee Valley Authority has aggressively provided assistance to localities and has provided flood information to most of the localities with identified serious flood hazards in the Tennessee River Basin. (See p. 29.)

Need for better monitoring and leadership for Federal flood control efforts

In 1966 the President directed the Office of Management and Budget to monitor implementation of task force recommendations. However, since 1970 this agency's efforts have been

limited to spot checks of budget requests to determine whether agencies were building in flood plains. The Office of Management and Budget should actively monitor the actions of the agencies. (See p. 38.)

The Office of Management and Budget assigned several major task force recommendations to the Water Resources Council. The Council assumed a leadership role because some of the recommendations called for developing uniform guidelines and standards to aid Federal agencies in evaluating flood hazards. It took the Council many years to accomplish some of the recommendations while others remain still unaccomplished. The Council must be more effective in implementing its part of the unified national program. (See pp. 39 and 40.)

Actions by State and local governments to minimize flood losses

Reduction of flood losses depends upon cooperative Federal, State, and local government efforts.

Of the six States GAO visited, two had enacted statewide flood plain legislation, one had provided more stringent building codes for flood-prone areas, and the other three had not enacted legislation. (See p. 43.)

Many localities had not requested Federal assistance to identify flood hazards and the techniques to reduce flood losses. In some cases where

Federal assistance was obtained, there had been a lack of action to enact State or local land use ordinances that would minimize the effects of flooding. (See p. 44.)

Localities cited these reasons, among others, for not taking action:

- Restricting the use of privately owned land was unpopular.
- Regulating development would hinder the economic growth of the area.
- Lack of awareness of available Federal assistance or of the requirements placed upon them if assistance was requested. (See p. 45.)

Flood Disaster Protection Act of 1973

The National Flood Insurance Program administered by the Federal Insurance Administration allows property owners to buy insurance for protection against flood losses at federally subsidized rates. For property owners to be eligible for such insurance, the localities must adopt and enforce land use and control measures.

The Flood Disaster Protection Act of 1973 requires that localities with special flood hazards participate in the National Flood Insurance Program in order for Federal agencies to approve financial assist-

ance for acquisition or construction of property in the locality after July 1, 1975. (See pp. 3 and 7.)

Flood insurance reports, which differ somewhat from flood plain information reports, are used to estimate actual and potential flood damages and to determine actuarial rates for the flood insurance program. These reports are prepared by various agencies, including the Corps, the Tennessee Valley Authority, and the Soil Conservation Service. (See p. 33.)

GAO believes that the act should provide localities with greater incentives to regulate the development of flood-prone lands. (See p. 47.)

RECOMMENDATIONS OR SUGGESTIONS

The Secretaries of Agriculture and Housing and Urban Development and the Administrators of General Services Administration and Veterans Administration should establish requirements that their field offices evaluate flood hazards for their construction, financing, and disposal programs, including both new and existing properties. These requirements should include the 100-year flood frequency criteria established by the Water Resources Council. GAO also recommends that the agencies establish monitoring systems to insure compliance with the requirements. (See p. 22.)

The Secretaries of Agriculture and the Army should

--allocate additional resources to technical assistance efforts to help State and local governments achieve the objectives of the national program for reducing flood losses and give priority to assisting the Federal Insurance Administration in providing the information required under the National Flood Insurance Program and

--require preparation of shorter versions of the flood plain information reports. (See p. 35.)

The Secretary of the Army should also

--establish procedures for systematically informing localities of assistance available and

--establish more effective procedures for insuring that the results of flood information studies are used effectively. (See p. 35.)

The Director of the Office of Management and Budget should more effectively monitor actions of Federal agencies in considering flood hazards in their programs and in providing technical assistance to State and local governments. The Director of the Water Resources Council should take action to more effectively fulfill its responsibilities. (See p. 41.)

AGENCY ACTIONS AND UNRESOLVED ISSUES

The agencies concerned generally agreed with GAO's conclusions and recommendations and indicated that corrective action would be taken. (See pp. 22, 35, and 41.) While the Departments of Agriculture and the Army indicated that additional funding would be sought for providing assistance to communities, the increase in the number of studies will be minimal. (See pp. 35 and 36.)

GAO asked the Office of Management and Budget for comments on this report but received no response. However, an official told GAO that the information in the report would be used in reviewing the agencies' budget and program requests. (See p. 41.)

MATTERS FOR CONSIDERATION BY THE CONGRESS

In view of the limited progress being made in providing needed technical assistance to localities, GAO recommends that the Congress require that the Corps of Engineers and the Soil Conservation Service budget submissions include information on plans, funding projections, and time estimates for completing needed technical assistance projects. Such information would provide a foundation for the Congress to set meaningful goals and funding levels for completing such projects. (See p. 36.)

END

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